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ENVIRONMENT
& HEALTH

Sent via Electronic Mail and Aconex

Ms. Michelle Granger
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Emergency & Remedial Response Division
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**ADDENDUM NO. 2 TO DRAFT REMEDIAL ACTION WORK PLAN
OPERABLE UNIT 3, POHATCONG VALLEY GROUNDWATER
CONTAMINATION SUPERFUND SITE, WARREN COUNTY, NEW JERSEY**

November 14, 2019

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Ref. 1690008019-010

Dear Ms. Granger:

On behalf of Pechiney Plastics Packaging, Inc. (PPPI) and Luis Hidalgo (Rio Tinto), Project Coordinator for Operable Unit 3 (OU3), and pursuant to Section XI.A of the United States Environmental Protection Agency- (USEPA) approved Statement of Work (SOW)[1] for OU3, the Consent Decree (CD)[2], and the design for the selected remedy identified in the USEPA Record of Decision (ROD)[3] for treatment of soils of Source Area A of OU3, Ramboll US Corporation (Ramboll) submits the enclosed *Addendum No. 2 to the Draft Remedial Action Work Plan, Operable Unit 3, Pohatcong Valley Groundwater Contamination Superfund Site, Warren County, New Jersey* ("RAWP Addendum No. 2") enclosed as Attachment 1.

The enclosed RAWP Addendum No. 2 in Attachment 1 includes:

- Revised text to the Draft Remedial Action Work Plan Addendum No. 1 (Ramboll, October 2019) ("RAWP Addendum No. 1") in redline/strikeout format (to illustrate the proposed changes)
- Revised Figure7 (Indoor Air Monitoring Locations During ISTR) to the to the Draft RAWP
- Revisions to Draft RAWP Appendix A (Electrical Contractor Certifications)
- Revisions to Draft RAWP Appendix C (Traffic Management Plan)
- Revisions to Draft RAWP Appendix D (Field Sampling Plan)
- Revisions to Draft RAWP Appendix F (OM&M Plan)
- Revisions to RAWP Addendum No. 1 Appendix G (Health and Safety Plan)

[1] Pursuant to Section VI. Paragraph 12.c(1) of the CD, USEPA approval of the OU3 SOW was received on June 26, 2017.

[2] In the matter of United States of America v. PPPI (Civil Action No. 09-cv-05692) and United States of America v. Bristol Myers Squibb Company, et al. (Civil Action No. 13-cv-05798) effective March 11, 2015.

[3] USEPA Record of Decision – OU3 Study Area dated September 30, 2016.

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Should you have any questions concerning this submittal, please do not hesitate to contact us.

Sincerely,

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Enclosures:
Attachment 1 – Responses to USEPA Request for Clarifications Received by E-Mail Dated 11/4/2019
Attachment 2 - Addendum No. 2 to Draft Remedial Action Work Plan

Distribution:

New Jersey Superfund Branch, Office of Regional Counsel United States Environmental Protection Agency Region 2 290 Broadway, 17th Floor New York, New York 10007 Attn: Frances Zizila, Attorney for Pohatcong Site	Cover letter + electronic files via Aconex
Fred Mumford, New Jersey Dept. of Environmental Protection	Cover letter + electronic files via Electronic Mail
Joshua Watts, U.S. Army Corps of Engineers	Cover letter + electronic files via Electronic Mail
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Russ Gladd, Albéa Americas	Cover letter + electronic files via Electronic Mail
Daniel Fortaney, Albéa Americas	Cover letter + electronic files via Electronic Mail
Bruce White, Barnes & Thornburg, LLP	Cover letter + electronic files via Electronic Mail

ATTACHMENT 1

Addendum No. 2 to Draft Remedial Action Work Plan

Prepared for
Pechiney Plastics Packaging, Inc.
South Jordan, Utah

Submitted to
United States Environmental Protection Agency
New York, New York

Prepared by
Ramboll US Corporation

Date
~~October~~November 2019

Project Number
1690008019

DRAFT REMEDIAL ACTION WORK PLAN

OPERABLE UNIT 3, POHATCONG VALLEY GROUNDWATER CONTAMINATION SUPERFUND SITE WARREN COUNTY, NEW JERSEY

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ACRONYMS AND ABBREVIATIONS

3D	three-dimensional
cm^2	square centimeters
cm/sec	centimeters per second
lb/hr	pounds per hour
mg/kg	milligrams per kilogram
ppm	parts per million
scfm	standard cubic feet per minute
µg/L	micrograms per liter
$\mu g/m^3$	micrograms per cubic meter
AC1	Area of Concern 1
AIDV	Analytical Interval Data Value
Albéa	Albéa Americas, Inc.
ANC	American National Can
bgs	below ground surface
CD	Consent Decree
CERCLA	Comprehensive Environmental Response, Compensation, and Liability
CO	carbon monoxide
CO_2	carbon dioxide
CQA	construction quality assurance
CQAPP	Construction Quality Assurance Project Plan
CVOCs	chlorinated volatile organic compounds
DNAPL	dense non-aqueous phase liquid
DL	drain lines
DO	dissolved oxygen
DOT	Department of Transportation
DRM	diesel particulate
ECD	electron capture detector
EDD	Electronic Data Deliverables
ENVIRON	ENVIRON International Corporation
ERH	electrical resistance heating
EV	electron volt
EVS	Earth Volumetric Studio
GAC	granular activated carbon
GC	gas chromatograph
GWETS	Groundwater Extraction and Treatment System
HC	hydrocarbons
HCHO	diesel odor
ICs	institutional controls
ICIAP	Institutional Control Implementation and Assurance Plan
IDW	investigative-derived waste
ISTR	*in-situ* thermal remediation
MNA	monitored natural attenuation
MS/MSD	matrix spike/matrix spike duplicate
NELAP	National Environmental Laboratory Accreditation Program
NJDEP	New Jersey Department of Environmental Protection
NPT	National Pipe Tapered
NTUs	nephelometric turbidity units
OM&M	operation, monitoring, and maintenance
ORP	oxygen reduction potential
OU1	Operable Unit 1

OU2	Operable Unit 2
OU3	Operable Unit 3
PCBs	polychlorinated biphenyls
PCE	tetrachloroethene
PDI	pre-design investigation
PID	photoionization detector
PPE	personal protective equipment
PPPI	Pechiney Plastic Packaging, Inc.
PPW	private potable well
PTFP	polytetrafluoroethylene
P/TSE	Pilot/Treatability Study Evaluation
PVGCS	Pohatcong Valley Groundwater Contamination Superfund
QA	quality assurance
QA/QC	quality assurance/quality control
QAPP	Quality Assurance Project Plan
QC	quality control
RA	remedial action
Ramboll	Ramboll US Corporation
RAOs	Remedial Action Objectives
RAWP	Remedial Action Work Plan
RD	remedial design
RD/RA	Remedial Design/Remedial Action
RDWP	Remedial Design Work Plan
RG	remedial goal
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
SEE	steam-enhanced extraction
SOF	soluble organics
SOPs	Standard Operations Procedures
SOTA	state-of-the-art
SOW	Statement of Work
SSD	sub-slab depressurization
SSO	Site Safety Officer
SVE	soil vapor extraction
SVOCs	semivolatile organic compounds
T&D	transportation and disposal
TBC	to-be-considered
TCH	Thermal Conductive Heating
TOC	total organic carbon
trichloroethene	TCE
TPY	tons per year
TTZ	target treatment zone
UL	Underwriters Laboratories Inc.
USACE	United States Army Corps of Engineers
USCS	Unified Soil Classification System
VTC	Vikon Tile Corporation
VIRA	Vapor Intrusion Removal Action
VMP	~~vacuum~~ vapor monitoring ~~point~~probe
VOCs	volatile organic compounds
WLY	Warren Lumber Yard

1. INTRODUCTION

1.1 Purpose and Scope of Remedial Action

On behalf of Pechiney Plastic Packaging, Inc. (PPPI), Ramboll US Corporation (Ramboll) has prepared this Remedial Action Work Plan (RAWP) for the remedy selected by the United States Environmental Protection Agency (USEPA) to address trichloroethene (TCE) impacts in vadose zone soils at Operable Unit 3 (OU3) of the Pohatcong Valley Groundwater Contamination Site (PVGCS), hereinafter referred to as "Site" located in Warren County, New Jersey (United States Environmental Protection Agency [USEPA] ID# NJD981179047).

The PVGCS site encompasses an area of about 16.5 square miles (10,600 acres) that extends about 8.5 miles along the length of the Pohatcong Valley, which is a northeast-southwest trending valley bounded by mountains. The location of the Site is shown in Figure 1. The Site is divided into three operable units. The OU3 Study Area is located in Washington Borough and is defined by the USEPA as the area that has been identified as the source area for TCE within the aquifer. The OU3 Study Area comprises four properties known as: ANC Area of Concern 1 (AC1), Vikon Tile Corporation (VTC), and Warren Lumber Yard (WLY) properties. A site map showing the location of OU3 is presented on Figure 2. This RAWP focuses on remediation of Source Area A, which contains the deep TCE-contaminated soils underlying the southwestern portion of the former ANC building identified as the volume of soils to be treated in the USEPA's Record of Decision (ROD)[1] for OU3.

As provided in the ROD, the major components of the selected remedy for OU3 (Source Area A) include:

- The implementation of deep soil vapor extraction (SVE) and/or thermal treatment to address deep soil contamination underlying the former American National Can (ANC) building.
- Long-term operation and maintenance of the existing shallow SVE and sub-slab depressurization (SSD) systems within the former ANC building.
- Long-term groundwater and indoor air monitoring in the OU3 Study Area will be performed over time to assess the remedy's effectiveness.
- Institutional controls (ICs), including the existing deed notice, will remain in effect at the former ANC property and will be amended to reflect the components of the selected remedy for OU3 that will be implemented at the former ANC property. The institutional controls periodically will be verified as remaining in effect as part of the long-term monitoring effort.

Based on soil sampling results obtained at OU3 (Source Area A) during pre-design investigations, SVE pilot testing, and technical evaluations of various thermal remediation technologies as presented in the Final (100%) Remedial Design Report (Ramboll, 2019), In-Situ Thermal Remediation (ISTR) using thermal conductive heating (TCH) technology is proposed as the preferred manner for addressing soils at OU3 (Source Area A). Pursuant to Section IX of the USEPA approved Statement of Work (SOW)[2] for OU3, the Consent Decree (CD)[3], and the design for the selected remedy identified in the USEPA ROD for treatment of soils of Source Area A of OU3, Ramboll, on behalf of PPPI submitted the Final (100%) Remedial Design Report to USEPA on

[1] USEPA Record of Decision – OU3 Study Area dated September 30, 2016.
[2] USEPA approval of the OU3 Statement of Work in a letter dated June 26, 2017.
[3] In the matter of United States of America v. PPPI (Civil Action No. 09-cv-05692) and United States of America v. Bristol Myers Squibb Company, et al. (Civil Action No. 13-cv-05798) effective March 11, 2015.

April 24, 2019. In a letter dated May 23, 2019, USEPA approved the Final (100%) Remedial Design Report.

This work plan presents the implementation activities associated with the construction, installation, startup, and decommissioning of the approved thermal treatment remedy. In addition, the required permitting activities for construction and operation of the ISTR system along with remedial action reporting activities, including an implementation schedule is presented.

1.2 Work Plan Organization

As described in the sections that follow, this Work Plan provides the proposed plan and methodology for construction, installation and startup of an In-situ Thermal Remediation (ISTR) system to address the identified deep soil contamination underlying the former ANC building:

- Section 2 – Project Organization
- Section 3 – Summary of Approved Remedial Action
- Section 4 – Remedial Construction Activities
- Section 5 – Construction Quality Control
- Section 6 – System Functional Testing and Startup
- Section 7 – System Operation, Maintenance and Monitoring
- Section 8 – Health, Safety, and Environmental Protection Measures
- Section 9 – Permits
- Section 10 – ISTR System Decommissioning
- Section 11 – Remedial Action Reporting
- Section 12 – Schedule
- Section 13 – References

These tasks are discussed in detail in the sections that follow. The appendices provide construction contractor certifications (as requested by USEPA in their review of the Pre-final (90%) Remedial Design Report), a Construction Quality Assurance Plan, a Traffic Management Plan, a Field Sampling Plan, a Waste Management Plan, the ISTR system Operations, Maintenance, and Monitoring Plan (OM&M Plan), a Health and Safety Plan, and a Contingency Plan for the tasks to be performed during the remedial action.

2. PROJECT ORGANIZATION

This section presents the construction management organization for the OU3 remedial action (RA).

2.1 Construction Management Organization

This section presents the construction management organization for the OU3 RA, including project management roles, lines of communication, and responsibilities. Lead agency oversight for these RA activities will be provided by USEPA Region 2. The USEPA Remedial Project Manager for OU3 is Michelle Granger. The United States Army Corps of Engineers (USACE) will provide oversight and technical support to USEPA for the RA activities. PPPI is responsible for implementing the OU3 RA and has retained Ramboll as its Supervising Contractor and TRS Group as its Remediation

Contractor for the OU3 RA. Albéa is the Owner Settling Defendant to the CD. A project organization chart is provided as Figure 3.

2.1.1 PPPI Roles and Responsibilities

PPPI is responsible for implementation of the OU3 RA as required by the CD and the OU3 Statement of Work (SOW). On behalf of PPPI, Luis Hidalgo of Rio Tinto is the designated Project Coordinator for OU3. Brad Gibson and John Herring of Rio Tinto will serve as Site Managers during the implementation and will be responsible for managing compliance with Rio Tinto's health, safety, environment and quality management system (HSEQ MS) including monitoring safety needs and providing support to field construction staff.

2.1.2 Albéa Roles and Responsibilities

Ramboll has worked closely with the Owner Settling Defendant to the CD, Albéa, to integrate their operational and health and safety constraints into the implementation of the RA and continued vapor intrusion removal action on the former ANC property. The on-site Plant Manager is Mr. Daniel Fortaney. Mr. Felix Miranda is the on-site Environmental Health and Safety (EHS) Manager, and Mr. Russell Gladd is the on-site Plant Maintenance Manager.

Albéa remains committed to complying with its obligations under the CD to provide access to the site for PPPI to implement the RA for OU3. PPPI has coordinated with Albéa to move their current operations in the former Molding Room Area to an off-site warehousing location such that the former Molding Room Area will be available for the necessary duration for implementation of the RA for OU3. This will enable the installation of all the planned heater borings from within the former Molding Room Area to reach the target treatment zone for the OU3 RA.

2.1.3 Ramboll Roles and Responsibilities

PPPI has retained Ramboll as its Supervising Contractor for the OU3 RA, pursuant to the CD Section VI, paragraph 12.a. Mr. Bruce Kennington is the Ramboll Project Director and is the identified Alternate Project Coordinator under the CD for OU3. As Ramboll Project Director, Mr. Kennington reports to Dave Schlott (Principal Manager for Ramboll), thereby providing overall guidance and accountability, contract administration support, and ensuring adequate allocation of resources. In his capacity as Ramboll Project Director and Alternate Project Coordinator for OU3, Mr. Kennington reports to Luis Hidalgo on all matters for OU3 at the Site. In addition, David Heidlauf, a Principal Manager with Ramboll, will provide overall technical support. For management of health and safety for the project, Jeff Parsons will be responsible for managing compliance with the project-specific health and safety program and Nita Shinn and Adrian Ezeagu will serve as the lead Ramboll Site Safety Officers (SSOs).

Technical support on the ISTR implementation will be provided by Scott Tarmann (Project Engineer, Ramboll). Mr. Tarmann currently serves as the Project Engineer for the OU1 (TCE) Groundwater Extraction and Treatment System (GWETS) and Vapor Intrusion Removal Action (VIRA). Construction Quality Assurance Officer, Cynthia Bonczkiewicz, will be responsible for ensuring that the quality control testing required by the project specifications are conducted. Field work for the drilling activities will be managed by Stan Popelar and Michael Eddings (Field Manager and Senior Geologist). Field work for the installation/construction activities will be managed by James Cavotta. Field work for sampling activities will be managed by Stan Popelar and Angela DeDolph.

Technical support on the electrical supply installation and coordination for the high voltage line from the transmission line to the ISTR system electrical power control units will be provided by

Ramboll. Subcontractors will assist Ramboll in the installation of the power supply, testing, and inspections, as appropriate.

2.1.4 TRS Group Roles and Responsibilities

The selected ISTR system contractor is TRS Group, Inc. ("TRS") for the construction, operation and decommissioning for the OU3 ISTR remedy. For implementation of the ISTR system, TRS will designate their own site Health and Safety officer, construction quality assurance (CQA) officer, and construction supervisor. TRS will be responsible for their subcontractors, field crew and field equipment.

TRS has assembled an experienced team to support the implementation of ISTR activities at the Site. Overall, the project will be technically led and managed by Chris Thomas, Project Manager; Dan Oberle, Project Engineer; and Gorm Heron, ISTR Technical Lead. The drilling work and construction program will be led by Kevin Riffe, Construction Manager.

TRS has subcontracted the drilling work to multiple drilling firms to support the drilling operations for the OU3 ISTR remedy. The drilling operations will be led by Summit Drilling, Inc. a licensed drilling contractor in the state of New Jersey, with support from Great Southern Engineering (GSE), Parratt Wolff, Inc, and Summit Drilling.

TRS will be assisted by a New Jersey licensed electrical subcontractor and their certifications will be ~~provided in Remedial Action Addendum No. 2 and~~ included as Appendix A in the final RAWP.

3. SUMMARY OF APPROVED REMEDIAL ACTION

Based on the results of a Pre-Design Investigation, Environmental Visualization System (EVS) modeling of TCE impacts greater than 1 milligram per kilogram (mg/kg), and SVE pilot testing, the remedy selected and approved by the USEPA includes the implementation of ISTR using TCH technology to address deep soil contamination underlying the former ANC building. To attain the site-specific RG of 1 mg/kg within the TCE-impacted soils, a TCH system with co-located vapor extraction wells (VEWs) was designed for a targeted treatment zone (TTZ) of approximately 28,000 cubic yards. Additionally, the shallow SVE and the SSD systems installed as part of the VIRA will continue to operate during the implementation of the deep soil remedy. The remedy includes long-term groundwater and indoor air monitoring; and institutional controls. Components of the TCH remedial action (RA) include angled and vertical heater wells, co-located VEWs, temperature monitoring points (TMPs), vapor monitoring probes (VMPs), and a vapor and liquid treatment system.

Vapors and liquid discharge streams from the ISTR system will be treated using carbon-based vapor and liquid treatment systems. The liquids will be containerized and conveyed to the existing GWETS for disposal to the on-site GWETS injection wells. Treated vapors will be discharged to atmosphere through an emissions stack under a New Jersey Department of Environmental Protection (NJDEP) air permit to operate.

4. REMEDIAL CONSTRUCTION ACTIVITIES

This section provides a discussion of the RA activities associated with the construction of the ISTR system. Construction of the ISTR system generally includes but is not limited to: pre-construction site preparation; heater well and monitoring point installation; electrical service installation; process equipment installation; and system decommissioning. The RA activities also include

system functional testing, inspections, and system startup and operation. The ISTR system has been designed to reduce TCE contaminant mass in the vadose zone soil. TCH within the TCE impacted soil volume will be performed sequentially in three separate groups and is discussed in further detail below. Construction of the ISTR system will include work in the Former Molding Room of the former ANC building, some limited work in the Main Production Area of the building, and exterior work along the west and southwest sides of the Albéa building. Temporary equipment and materials staging laydown areas will be utilized on the north, west, and south sides of the facility during construction of the ISTR. The layout of the OU3 work areas and temporary laydown areas are shown on Figure 4.

In order to complete the construction and startup of the ISTR system, some activities will occur simultaneously with multiple construction crews. Construction activities presented in this section are in general chronological order. The following sections describe the planned construction activities for the ISTR system.

4.1 General Sequence of Construction

Following approval of this RAWP, personnel, equipment, and materials necessary to complete the installation of the ISTR system for OU3 will be mobilized to the Site. This includes a project/office and storage trailers with a temporary power supply to the office trailer and establishment of a high-speed internet connection. In addition, a wall is planned to be installed along the northwest portion of the molding room to provide a temporary barrier to isolate Albéa workers and facility operations from the ISTR construction activities and to help reduce noise levels outside the molding room from drilling activities. The wall is being installed on a temporary basis and may be removed at the completion RA activities. This temporary wall will be constructed using 3-5/8" 20-gauge metal studs at 16" on center with 5/8" type "X" gypsum wall board on each side and 3 ½" therma-fiber insulation. The wall will be 16'-4" high and 89'-3" in length and will be equipped with a door that is 6'-0" wide x 7'-0" high that is fire-rated and equipped with the necessary automatic door closing hardware.

To facilitate drilling of the angled heater fans inside the molding room, the existing ventilation ducts on the ceiling will be disassembled to allow space for the sonic drilling rigs to operate properly and be set-up and positioned at each heater fan location. Following the vent duct removal, the duct penetrations at the walls of the molding room will be temporarily capped and sealed. The duct sections removed from the molding room will be stored in a designated laydown area outside the Albéa building and placed on wood dunnage and covered with tarps. The ventilation duct will be reinstalled at the completion of the remedy and following abandonment of the TCH wells and decommissioning of the interior ISTR system.

With the former molding room fully enclosed, modifications to the existing air handling system will be performed to control the room temperature and provide sufficient ventilation while work activities are being performed. Modifications to the existing ventilation system will include utilizing the two existing air handling units inside the molding room to supply air into the room, and ~~one~~ three roof-top ~~air~~ centrifugal exhaust fans ~~handling unit~~ will be installed to exhaust the air from the room. Each air handling unit will be adjusted accordingly so the volume of air exhaust is greater than the volume of air supplied (a net removal of air from the molding room/building). At the completion of the remedy and following abandonment of the TCH wells and decommissioning of the interior ISTR system, the rooftop ventilation system will be removed, and the existing air handing units will be returned to their pre-construction operational settings. During drilling, exhaust from the equipment will be directly vented from the former molding room to the outdoors by installing and maintaining flexible exhaust hose/booster fans from each drill rig as needed.

Pre-construction activities include obtaining the appropriate construction and building permits, well construction permits, air permit (modification to PPPI's existing permit to operate) and providing notification to the NJDEP for the ISTR system liquid treatment and condensate discharge to the GWETS through the existing Discharge to Groundwater permit equivalency. Additionally, the utilities will be located at the Site and temporary fencing and/or barricades will be installed around the perimeter of the construction and support areas to control facility employees from entering the interior work zone during construction activities.

Initial site construction activities include surveying the wellfield to stake out/mark the planned TCH wells, ~~and~~ TMP locations, and VMP locations in accordance with the design plans. The TCH wells, ~~and~~ TMPs, and VMPs will then be installed using roto-sonic drilling methods to the design treatment and monitoring depths.

TRS has devised an approach to heat the soil in the TTZ in a sequential manner to improve the remediation completion timeframe. The sequential heating approach utilizes three heating groups, A, B, and C in which heating operations commence at different times during implementation of the RA. Group A is designated as the northern portion of the TTZ beneath the MPA and includes angled heater fans 7 through 15; Group B is designated as the southern portion of the TTZ beneath the MPA and includes angled heater fans 1 through 6; and Group C is designated as the remaining portion of the TTZ beneath the molding room and includes all vertical and angled TCH wells as shown on design drawing C102 (Wellfield Layout) in Remedial Action Addendum No. 1. Drilling of the TCH wells will start on the north end in Group A. Once drilling is complete in Group A, the drill crews will begin the install of TCH fans 1 through 6 and the angled TCH well located in Group B. Surface construction (installation of the heater elements, completion of TCH wellhead electrical connections, installation of process vapor piping, and process treatment equipment) will begin in Group A while Group B drilling occurs. Group A system functional testing, pre-final/final inspection, and startup of the ISTR system in Group A is anticipated to commence approximately one month after drilling begins in Group B.

During the TCH heater well installation in Group C, surface construction for the TCH wells installed in Group B will commence. Group B system functional testing, pre-final/final inspection, and startup of Group B is anticipated to commence approximately one month after drilling begins in Group C. Surface construction in Group C will be completed as treatment continues in Groups A and B. TCH in Group C is anticipated to commence approximately three months after treatment starts in Group B.

Following the TCH well, TMP, and VMP ~~and temperature monitoring point~~ installations in each Group, the TCH well liners, heaters and junction boxes at the TCH wells and the wiring of the thermocouples at the TMPs will be completed. Power and ground cabling will then be installed from the TCH wells to one of two power control units (PCU). Subsequently, above ground wellhead piping, valves, and hoses from the TCH wells to the vapor and liquid above-ground header piping will be installed, which will then be connected to the carbon-based vapor-liquid treatment equipment.

The vapor-liquid treatment equipment will then be installed on the exterior of the west side of the former ANC building. The vapor extraction and treatment system equipment includes a heat exchanger~~s~~/condenser, cooling towers, moisture separators, process blowers, vapor phase carbon vessels, and an exhaust stack. The liquid treatment system equipment consists of effluent pumps, bag filters, and liquid phase carbon vessels. A temporary discharge line will be installed from the liquid treatment system to the GWETS for transfer of condensate generated from operation of the ISTR system. A separate electrical power distribution service will be installed for the ISTR system,

which will also have an auxiliary power supply installed (generator). Also installed with the equipment and power supply will be system alarms and the remote system control access (programmable logic controller [PLC]).

Once all the ISTR system components are installed in each treatment group and have a power supply, it will be inspected, tested and calibrated along with all ancillary system components prior to start-up and operation, in accordance with the TCH System Commissioning checklists provided as Attachment 1 of the Construction Quality Assurance Plan (Appendix B). Clean (non-potable) water and air will be used to perform functional testing of the process treatment system equipment. During functional testing, the ISTR contractor will identify and correct deficiencies in the heating, extraction, monitoring and treatment equipment, to ensure a smooth transition to full, normal operation.

Upon completion of the functional testing and commissioning of the treatment system, the required start-up activities will occur in a sequential manner as each TTZ is installed. In addition, any needed site asphalt/concrete patching and clean-up from the construction activities will be conducted.

Following approval by the USEPA that remedial goals have been achieved, the ISTR system will be decommissioned from the Site. The TCH wells and TMPs will be abandoned, and the above-ground process treatment equipment will be removed. Additional decommissioning activities include the disconnection of the electric power supply and restoration (patching) of the concrete floor in the Former Molding Room area where the TCH wells were located.

4.2 Preconstruction Meetings

Before any site work, preconstruction meetings will be held. A preconstruction meeting will be held with Albéa representatives prior to scheduling any support or equipment mobilization. Attendees at this preconstruction meeting will include project representatives from PPPI, Albéa, Ramboll and TRS. A Kickoff meeting will also be held just prior to initial drill rig mobilization. Representatives from PPPI, TRS, Ramboll, USEPA, and USACE are expected to attend the Kickoff meeting. The meetings will be used to discuss lines of communication, schedules, health and safety procedures, and general project requirements. Notification will be sent to project representatives at least 2 or 3 weeks in advance of scheduling the preconstruction meetings.

4.3 Site Preparation and Controls

Site mobilization is anticipated to begin in November 2019. Mobilization will include the setup of temporary on-site facilities, setup of contractor support areas, and setup of temporary exterior lighting. The Contractors will begin coordinating the arrival of support facilities, materials, personal protection equipment (PPE), and heavy equipment, as well as the engagement of operators and laborers as needed.

Site orientation training will be conducted, including the establishment of personnel, equipment, safety, and operating procedures that will govern the project. Remedial action contractors will have site-specific training and Rio Tinto safety and critical risk management training prior to working at site. Ramboll and Rio Tinto will conduct this training prior to mobilization. The Rio Tinto HSEQMS program will be followed including daily/shift site inspections, equipment inspections and tailgate meetings.

4.3.1 Site Security

All personnel and visitors will be required to sign in at the Ramboll site construction office trailer located on the south side of the Albéa site before entering any construction or work area. Based on meetings held with Albéa facility personnel, a sign-in procedure has been established as follows:

- On-site TRS and Ramboll personnel will sign-in at the start of each work shift during the tailgate meeting and the sign-in sheet will be kept inside the Ramboll job trailer for access in the event of an emergency evacuation.
- Trained TRS and Ramboll personnel and their subcontractors will be issued contractor badges to be worn at all times when on-site.
- Any visitors will be given visitor training and will be escorted during their visit.
- TRS/Ramboll workers will access the building via west side door of the facility. Equipment will be mobilized to the molding room through the north side overhead door. Drill rigs will traverse to the west overhead door for entrance to the molding room. Construction equipment and materials will traverse to the facility with an escort and in accordance with the Traffic Management Plan (Appendix C).

All personnel working in the Former Molding Room must wear their contractor badges at all times to aid in identification of any non-authorized personnel in the area. Personnel will also be required to sign out prior to leaving.

The entire Albéa property is surrounded by chain link fencing, except at the driveway entrances. The existing GWETS building on the Albéa property is surrounded by permanent fencing and a locked gate. With the exception of the main entrance door, the Albéa exterior building doors along the west side of the building are typically locked. Traffic warning signs will be posted at the northern and southern contractor staging areas to alert Albéa delivery trucks, employees, and visitors traveling through the area.

Site controls will be established in and around the Former Molding Room for the safety of the remedial workers, Albéa workers and delivery personnel. The doorways leading to the Former Molding Room area will be blocked to prevent Albéa worker/pedestrians or forklifts in the ISTR work area. Caution/warning signage and barricades or caution tape will be installed at all entrances to the Former Molding Room prior to construction. Warning signs will be posted at the doorways into the Former Molding Room area to notify Albéa personnel and visitors to stay out of the work area without escort. An 8-foot wide corridor across the Former Molding Room will be kept free of equipment, cables and materials at all times to allow Albéa forklift traffic through the work area. This corridor across the Former Molding Room will be established and maintained throughout the OU3 RA activities. After installation of the TCH wells, bolt-down bollards will be installed at approximately 10-foot spacing along both sides of the corridor.

The south parking lot area on the Albéa property contains the Ramboll support trailer and sanitary facilities and will be used for designated contractor parking and as a secondary contractor laydown/material storage area. This contractor work area may be fenced for the duration of the OU3 RA activities using temporary metal chain link fencing and privacy screen, depending on Albéa requirements. Temporary metal chain link fencing will not be installed around contractor staging areas located to the north and northwest of the former ANC facility or around TRS's support trailer and tool storage area, both located to the west of the Albéa building.

Concrete jersey barriers and temporary fencing are already present around the existing VIRA SVE blower shed area, and additional concrete jersey barriers and temporary metal chain link fencing will be installed along the traffic-side of the Process Treatment Equipment Area to create one secure area along the western side of the facility building for protection from traffic throughout the duration of the OU3 RA activities. The new electrical equipment area to be located just south of the existing VIRA SVE blower shed area will be secured by concrete jersey barriers and temporary metal chain link fencing. The locations of these areas are depicted on Figure 4.

Chain link fencing will also be installed around the electrical equipment and new electrical power poles P-01 and P-02 to be installed near the existing Jersey Central Power & Light (JCP&L) transmission lines along the western property boundary. The location of this electrical equipment and fenced area is shown on Figure 4 and in the Design Drawings.

4.3.2 Utility Clearance

Prior to beginning drilling, trenching, or other intrusive activities, utility clearance will be coordinated to identify the locations of existing utilities. In addition, maps and record drawings of existing utilities will be reviewed with Albéa site personnel. Prior to the construction of the new electrical utility poles, transformers, and associated underground electrical installations, the Contractor will: 1) call the local One-Call service to mark all public utility locations in the vicinity of the work areas; 2) subcontract with a private utility locator to mark all private lines in the work area; 3) coordinate with Albéa property managers to confirm the location of known utilities on the Albéa site; and, 4) verify the depths of the known utilities by performing "soft digs".

The locations of the identified utility lines will be marked using color-coded survey paint or other field markings before trenching, drilling, or other intrusive activities begin. These markings will be maintained throughout the duration of construction activities. The field construction manager will be notified immediately of any unidentified utility encountered in the work area and precautions will be taken to protect the utility. Site controls will be in place (signage and construction equipment/vehicle routes) to establish safe distances from existing overhead power lines at the Albéa site.

Prior to drilling, the proposed locations of the TCH wells, ~~and~~ TMPs, and VMPs will be marked at the site by Geod Corporation, a New Jersey-licensed surveyor in accordance with N.J.S.A. 51:3-7. The horizontal location will be established within the New Jersey State Plane Coordinate System, based on the North American Datum of 1983. The elevation of the wells will be established relative to North American Vertical Datum of 1988. The proposed TCH well, ~~and~~ TMP, and VMP locations will be checked for underground utilities by a private utility locator prior to drilling with the upper few feet of the boring advanced by soft digging.

4.3.3 Support Facilities

Upon mobilization, the following temporary facilities will be furnished at the Site: furnished field offices, sanitation/hygiene facilities (separate men and women), waste containers, first aid equipment, spill control kits, fire protection equipment, and PPE. These facilities will be maintained throughout the project and will be removed after completion of all OU3 RA activities, including system decommissioning. The following services will also be provided: electricity, lighting, wireless internet, drinking water supply, sanitary waste disposal, and traffic management. The Ramboll support trailer is already present at the south end of the Site, and electric, HVAC, sanitary, and wireless internet services are already present in this trailer. A field office trailer for TRS will also be established at the west side of the Albéa building, and this trailer will be equipped with electric, HVAC, and internet services. Sanitation/hygiene facilities will also be installed near the TRS support trailer.

4.3.4 Material Staging and Transport

Equipment and material staging areas will be constructed at the northern and southern ends of the Albéa property. The primary laydown areas for construction materials will be at the north end of the property (Staging Area #1) and along the existing northwestern property fence (Staging Area #2). A secondary laydown area will be located near the Ramboll support trailer in the south parking lot of the Site. Waste material roll-off boxes will be staged in the primary laydown areas (Staging Area #1 and #2). The locations of the contractor laydown areas are shown on Figure 4.

The Contractor will be procuring materials and supplies for well installation from vendors with warehouse facilities in relatively close proximity to the Site to allow for deliveries of materials as needed for the project. The necessary materials and equipment transported to the Site will be staged on the primary and/or secondary laydown areas. Material and equipment deliveries to the Site will follow the route designated in the Traffic Management Plan provided in Appendix C. Signage will be installed as noted in the Traffic Management Plan to direct Albéa delivery traffic safely through the work area and to direct site employee vehicles around the layout/staging areas.

The TRS support trailer, process equipment trailers, and tool storage area will be located on the west side of the Albéa building as shown in the Final 100% Design Report and on Figure 4. For the process treatment equipment installations, TRS' equipment will be shipped from its storage facility, which will allow for sequencing of equipment deliveries as equipment is needed for installation at the Site.

At the Site, materials and equipment will be transported into and out of the facility through an overhead door on the west side of the Albéa facility. The location of the overhead door to be used is depicted on Figure 4. A temporary gravel ramp will be installed at the location of the overhead door to facilitate equipment access and egress on the west side of the Albéa facility. An interior equipment transport route will also be established for transporting materials and equipment from the overhead door area to the Former Molding Room, and this interior route is shown on Figure 5.

4.3.5 Exterior Lighting

Exterior lighting will also be installed at the west and north sides of the facility building, as the TCH well drilling activities will be conducted during second and third shifts. The Contractor will provide three diesel-powered, trailer-mounted temporary light towers. One light tower will be placed to the west of the building for security during night-time work, and two light towers will be placed to the north of the building to illuminate the contractor laydown areas where equipment and materials will be staged.

4.4 Electrical Power Supply Installation

A separate electrical power supply service will be installed from one of the two existing Jersey Central Power and Light (JCP&L)/First Energy 34.5 kilovolt (kV) three-phase overhead transmission lines that cross at Route 31 North and continue west along the south side of the Albéa property. The electrical service for the ISTR system will be connected to the northern 34.5 kV transmission line to avoid disrupting the power quality that currently serves the Albéa facility.

The designed electrical supply plan has been submitted to First Energy for review. Upon approval of the plan, a new power pole will be installed by an electrical contractor near the existing First Energy 34.5 kV overhead transmission line, and the north circuit will be connected by First Energy to create a new 34.5 kV customer-owned primary service. The new customer-owned 34.5 kV pole will be completed with a group operated switch to feed a second pole with a fused disconnect switch and metering cabinet with ground mat and loop. The utility pole locations will be cleared for underground utilities by Geod Corporation, prior to placement.

The electrical power service will be routed overhead to two 2,500 kVA transformers (T-1 and T-2) located adjacent to the ISTR treatment equipment staging area and south of the existing VIRA SVE blower shed area along the western exterior wall of the Albéa facility. Transformers T-1 and T-2 will serve the ISTR system by feeding two separate PCU's for ISTR system operation, while transformer T-2 will be optional depending on the final power demand needed for the project. The ISTR electrical power distribution service installation details are provided in the design drawings.

The ISTR contractor's licensed electrician will run secondary conductors from breakers off the main switchboard PCU's to downstream panel boards that feed the heater and process equipment. All equipment will be installed, wired, and commissioned in accordance with the National Electrical Code. The electrical subcontractor's certifications are provided in Appendix A.

Backup power to operate the above-ground treatment system components is currently planned via an automatic transfer switch utilizing a 150-kilowatt (kW) diesel-powered generator. The generator will be mobilized to the site prior to system start up and located adjacent to transformers T-1 and T-2, west of the Albéa building.

4.5 Facility Pre-Construction Condition Survey

Prior to the construction of the OU3 RA, a facility pre-construction condition survey will be completed. Visual inspections of interior structural elements in the ISTR area and exterior pavement/surface conditions where construction activities will occur will be conducted to document their condition prior to construction. Interior structural elements to be inspected include, but are not limited to, walls, floor slab, doorway headers, and wall and column footings. A photolog will be prepared for the pre-construction condition survey.

Visual inspections will be completed routinely throughout the construction and operation of the ISTR system. Each inspection will be documented in a photolog, and any signs of excessive settlement or movement of interior structural elements will be reported to the Project Engineer. The visual inspections are to be completed according to Section 02 21 13 of the Technical Specifications.

4.6 Settlement Monitoring Benchmarking

A baseline survey will be conducted to set benchmarks and elevation survey control points within the Former Molding Room of the ANC building, where subsurface heating will occur. The baseline benchmarking survey will establish a minimum of 25 elevation monitoring locations within the footprint of the treatment area, with bench points co-located with structural building features such as columns and at the base of load-bearing walls, where feasible. A set of control points will also be established well outside the influence of the ISTR system. The benchmarking will be conducted in accordance with Section 02 21 13 of the Technical Specifications. The locations of these elevation monitoring points are depicted on Figure 6.

The baseline survey will be conducted prior to ISTR system startup and operation. During system operation and after the active remediation period, elevation survey measurements will be collected according to the following schedule:

- First 60 days of active remediation (Group A heat-up period) (Days 1 – 60): One round of measurements taken approximately every 20 days (for a total of 3 measurement events)
- Days 61 – 256478 (during system operation and sequential heating of Groups A, B, and C): One round of measurements taken approximately every 1460 days during operation (for a total of 14 8 measurement events)

- Days ~~257~~479 – ~~365~~525 (post-remediation): One round of measurements taken approximately every 30 days ~~during operation~~ (for a total of ~~4~~2 post-remediation measurement events)

In the event that the ~~elevation~~ monitoring results show a continuing trend of differential settlement, the ~~two additional~~ measurement ~~events~~ frequency will be ~~conducted~~ increased~~(one measurement at~~ to approximately every 30 days~~)~~. The survey data will be reviewed by the Project Engineer, and a log of the survey data for each measurement round will be maintained.

4.7 Thermal Remediation System Installation

The ISTR system is comprised of several components to be installed at the Site. The TCH wells~~,~~ ~~and~~ thermocouples, and VMPs will be installed within the Albéa facility using roto-sonic drilling methods. The TCH wells will supply heat by thermal conduction to the subsurface, and each heater boring will be equipped with VEWs to extract the vapors. The thermocouples will be used to monitor subsurface temperatures. The VMPs will be used to collect sub-slab vacuum and PID measurements to verify that the ISTR vapor extraction system remains effective in preventing soil vapors from migrating to the upper vadose zone soils. The vapor and liquid process treatment equipment will be installed along the western exterior side of the Albéa facility. The ISTR process conveyance piping and electrical equipment will be installed within the facility to convey the extracted vapors and provide electrical power, respectively. Condensate discharge piping will be constructed to discharge treated condensate to the on-site GWETS for injection. Additionally, an indoor air monitoring system will be installed for operation during ISTR system operation. These components of the thermal remediation system installations are discussed further in the following sections.

4.7.1 TCH Wells

Fifty-seven (57) vertical and 121 angled TCH wells with co-located vapor extraction wells (VEWs) will be installed as part of the ISTR system. The locations of these TCH wells are presented in design drawing C102 (Wellfield Layout). Due to Albéa facility constraints, the drilling work to install the TCH wells will be conducted during second shift, which includes working at non-routine hours (e.g., late afternoon and evening). The Contractor is scheduled to operate sonic rigs on a 10 day on 4 day off schedule over a two week period. At the start of drilling, there will be two rigs operating during a single second shift until the first 8-day rotation is complete (shortened by Thanksgiving holiday). Subsequently, a 3rd and if conditions allow 4th rig will be added and will also operate during second shift over the same two week rotation. The sequencing of the TCH well drilling activities is presented in Table 1. Ramboll will provide oversight for casing, screen, sand pack, grout and vapor points installation at the depths defined in design drawing C103 (Typical Well Construction Details) ~~Remedial Action Addendum No. 1~~.

Following the utility clearance, all vertical TCH well locations will be cored through the concrete slab with the sonic rig. Approximately six locations will be cleared before drilling starts and the remainder will be done as the drilling operation progresses. Small rectangular trenches will be saw cut at the angled TCH well locations. Wet saw cutting methods will be used to control dust, and the cut concrete will be removed. The borings for the TCH wells will be completed using roto-sonic drilling methods. Advancement of the borings will be completed using a 6-inch override casing to the terminal depth of the well boring. In this configuration, 5-foot and 10-foot soil core barrels of an appropriate size will be advanced to collect the soil core. Soil removed from the core barrels will be containerized and transported to a roll-off contained staged on the primary laydown area.

The stainless steel heater well casing sections will be welded using a tungsten inert gas (TIG) welder by a TRS-qualified welder as they are installed. The heater elements and associated cabling will be installed once the TCH wells have been completed. An electrical junction box will be installed at each TCH heater well location and electric conductors from each junction box will be routed to the PCU.

The azimuths and angles of inclination for angled TCH well installation were determined by utilizing the EVS model to determine the depths of treatment. TRS calculated the well angles required to reach those treatment depths based on the EVS model. Prior to drilling, each TCH well location will be staked/marked in the field by a professional surveyor (Geod) using the coordinate system and vertical datum established for the project. For each angled TCH well, the azimuth angle of the borehole will be marked at the boring location and an offset marker will be placed referencing 0 degrees north to be used for subsequent borehole alignment verification. In addition, a measurement of the reference azimuth angle with respect to true north will be established during the survey. The reference azimuth angles will be marked using the established site coordinate system with 0 degrees representing coordinate north, 90 degrees representing coordinate east, 180 degrees representing coordinate south and 270 degrees representing coordinate west, consistent with the EVS model coordinate system. Prior to well installation, the drilling angle from horizontal or borehole inclination and azimuth angle will be measured in the field using ~~a digital level mounted on the drill rig tower and the sonic casing and/or~~ a DeviAligner™ portable surface alignment tool. The DeviAligner™ is a portable battery operated north seeking gyroscope alignment system designed to make and record highly accurate measurements of true north, inclination, and roll angles by attaching the instrument to the drill ~~rig tower and the well~~ casing before advancement of the drill string.

Ramboll will verify that the angled borings are installed within an acceptable tolerance such that they do not substantially deviate from the borehole inclination, azimuth angle and location coordinates identified in the 3D EVS model and final design drawings/specifications. Borehole surveying methods will be used to measure the direction and inclination of the angled boreholes, enabling the calculation of trajectory coordinates while the TCH wells are being installed. The borehole surveying method will utilize a DeviFlex™ survey tool which is a non-magnetic multi-shot survey instrument that is used inside the drill string. The DeviFlex™ survey tool is not affected by magnetic disturbance and can be used in all types of rock formations, in cased boreholes and in boreholes adjacent to steel or other objects that locally alter the earth's magnetic field. The DeviFlex™ is an electronic instrument that uses tri-axis accelerometers to measure the absolute inclination and the rotation angle of the instrument axis at any given position and strain gauge sensors to detect the deflection over the length of the instrument. The sensor data obtained during a borehole survey is stored in an internal memory within the unit and is downloaded when the tool is retrieved. The surveying equipment includes a PDA and software to collect and interpret the data.

The instrument will be deployed directly inside the TCH casing to facilitate use of the tool with standard parts fitting in BWL, NWL and HWL drill string. A wireline is attached to the top of the DeviFlex™ and secured to a spool for measurement of instrument depth and for safe deployment and retrieval. The survey is generally performed by placing the DeviFlex™ at a given depth. Once the instrument is installed to depth the tool will take a measurement to read and record the sensor data. Once recorded the survey tool is raised or lowered to the next depth and a new measurement is recorded. Together with the user inserted depth value, the sensor data is processed into azimuth, inclination and borehole coordinates. As the DeviFlex™ measures the bend of the instrument between three centralizers, the depth interval between measurement points must be shorter or equal to the length of the instrument unit (4m/13ft). As a result,

several measurement points will be collected over the length of each angled TCH well to determine its alignment. During installation of the angled TCH wells, up to three deployments of the DeviFlex™ survey tool will be made at each TCH well to confirm the boring alignment is on target.

After retrieval and removal of the instrument from the borehole, a communications cable is connected to the PDA to display and download the coordinates of the borehole measurements along with a profile of the hole. The results are instantaneously displayed on the PDA for determination of borehole alignment. Each angled TCH well survey and profile will be evaluated with respect to the maximum established borehole deviation tolerance of 4 feet in any direction (based on the thermal model requirements). After verifying the borehole alignment measurements/coordinates are within tolerance, TRS will confirm the installed annular material depths, screen depths, and heater well liner depths.

To confirm the extent of TCE in soil >1 mg/kg in the areas to the north (north of PDI-SB33) and south (south of PDI-SB32) of the identified impact area, vertical soil samples will be collected from within the main production area during the Christmas Holiday plant shutdown. One to two borings will be installed at the north and south ends of the plume edge for a total of two to four borings. The proposed locations of the initial soil borings to the north and south are shown on Figure D-3 of the Field Sampling Plan in Appendix D. Soil samples will be collected between the depths of 75 to approximately 120 feet bgs from each boring using the same sampling procedures and methodology as described in the Pre-Design Soil Sampling and Analysis Plan (Ramboll, 2018). Sampling will be conducted in accordance with the Field Sampling Plan, which is provided as Appendix D. Samples will be sent to Test America in Edison, NJ for TCE analysis. These data will be used to verify the EVS modeled extent of the TCE impacts south of PDI-SB32 and north of soil boring PDI-SB33, and to ensure that the remedy is sufficiently designed to treat the soil volume exceeding 1 mg/kg at these locations. ~~All other~~ TCH well borings will be drilled without sampling.

The wellfield layout for the Site utilizes a heater spacing of approximately 15 to 20 feet, varying with locations and depth depending on the installed/drilled angles, and based on practical limitations for installation. The wellfield layout is presented in the Design Drawing C-102. Vapor extraction wells will be co-located with each heater, with vapor capture from the shallowest heater in each fan, and at angled borings not within a fan group screened across the depth of the TTZ. Co-located vapor extraction wells for the vertical borings and for fan heaters not at the shallowest angle of the fan group will be screened across the top 20 ft of the TTZ. The purpose of the vapor extraction points is to extract contaminant mass from the TTZ as the mass is volatilized by the TCH wells. To attain the goal of 1 mg/kg for TCE, the TTZ will be heated to temperatures between 87 and 100°C, with an operational target of reaching a temperature of 90°C in at least 95% of the thermocouple locations inside the TTZ.

The TRS heater design incorporates the use of a "cold pin" to reduce heating of soils above the treatment zone. The cold pin will only heat up at about 1/14th the rate of the heater element and will generate only a small amount of heat in the upper 60 feet of soil above the TTZ. To reduce heat in the "cold pin" section, the heater element will be constructed using a copper rod to carry the electrical current through the portion of the heater element above the TTZ. Due to the lower electrical resistance of copper versus nickel, the heat generated over the "cold pin" section is significantly reduced in the upper 60 feet of soil. This design saves energy and prevents the soil below the building floor from being heated.

4.7.2 Thermocouples

Seven (7) additional temperature monitoring points (TMPs) will be installed as part of the thermal remediation system installation. Eleven (11) TMPs were previously installed during the pre-design investigation activities. The seven TMPs will be installed within the TTZ at the locations shown on Drawing C102 – Wellfield Layout in the Final 100% Design Report (Ramboll, 2019). The TMPs will be completed using roto-sonic drilling methods, with a 1.5-inch diameter carbon steel casing installed at each location. A flush-mounted well box will be installed at the surface of each TMP. One of the TMPs to be installed is located in the MPA of the Albéa facility. This TMP, T-14, will be installed during the facility's holiday shutdown scheduled to occur in late December 2019 to early January 2020.

Thermocouples will be installed at each TMP after the drilling activities are completed. The thermocouples will be installed at approximately every 10 feet in the vertical interval from just below the surface of the building slab and transitioning to every 5 feet in the vertical interval from the top to the bottom of the TTZ to monitor heating progress. The thermocouples in the Former Molding Room will be hardwired to a repeater box and data is automatically collected using temperature logger software, organized in a database and posted real-time on a project specific webpage. Temperatures from the thermocouples in the MPA will be measured using a manual instrument or automatically collected from thermocouples equipped with wireless technology and temperature logger software.

4.7.3 Vapor Monitoring Probes

Two (2) additional VMPs will be installed as part of the thermal remediation system installation. Three (3) VMPs were previously installed during the pre-design investigation activities. The existing VMPs (VMP-1, VMP-2 and VMP-3) are located within the Group C heaters in the FMR. The additional VMPs will be installed within the Group A heaters (VMP-4) and Group B heaters (VMP-5) within the MPA. VMP-5 will be collocated with temperature monitoring point T-14. The two additional VMPs will be installed at the locations shown on Figure 7.

Each of the additional VMP borings will be installed to a total depth of 25 feet bgs and contain three monitoring ports (screens) at 5, 15, and 25 feet bgs. Each vertical monitoring port will be sequentially labeled using the "A" identifier for the shallowest, uppermost port, "B" for the next port in the sequence below and "C" for the bottom port. The intervals between the monitoring ports will be sealed with cement grout to isolate the screens and to prevent short-circuiting over the vertical profile. Each individual monitoring port will consist of a one-half-inch diameter stainless steel screen constructed by Geoprobe Systems® that is approximately 6 inches in length and connected to Fluorinated Ethylene Propylene (FEP) tubing that extends to the surface. The FEP tubing connected to each port will be colored to identify its location/depth interval (Green, Red, and Blue for the three depth intervals [A though C] at each VMP) and a ¼-inch stainless steel ball valve will be connected to the FEP tubing to facilitate connection to the necessary monitoring equipment. The ball valves will be protected in an 10-inch diameter flush-mounted steel protective compartment concreted in-place.

The two additional VMPs are located in the MPA of the Albéa facility, so they will be installed during the facility's holiday shutdown scheduled to occur in late December 2019 to early January 2020.

~~4.7.3~~4.7.4 Process Treatment Equipment

The process treatment equipment includes the vapor extraction and treatment system and the liquid treatment system. The process treatment system equipment will be installed near completion of the drilling activities for the Group A heater wells as described in Section 4.1.

Vapor Extraction and Treatment System

The vapor extraction and treatment system consists of the following major components: vapor heat exchanger or condenser; moisture separator; process blowers; vapor phase carbon vessels; cooling tower; and exhaust stack. The system components will be delivered to the site on a flat-bed trailer, and an all-terrain forklift will be used to offload the process equipment and move each component to its designated location along the west side of the facility building. The location of the process treatment equipment is depicted on Figure 4, and the system configuration is presented on Drawing M101 in the Design Drawings.

Once installed, the Contractor's electrical subcontractor will complete the necessary electrical installations, and the necessary piping and other ancillary installation connections will be completed in accordance with the Design Drawings.

Liquid Treatment System

The liquid treatment system consists of the following major components: bag filters; liquid phase carbon vessels; temporary effluent holding tanks and transfer pumps. The system components will be delivered to the site on a flat-bed trailer, and an all-terrain forklift will be used to offload the process equipment and move each component to its designated location along the west side of the facility building. The location of the liquid treatment system is depicted on Figure 4, and the system configuration is presented on Drawing M101 in the Design Drawings.

Once installed, the Contractor's electrical subcontractor will complete the necessary electrical installations, and the necessary piping and other ancillary installation connections will be completed in accordance with the Design Drawings.

~~4.7.4~~4.7.5 ISTR Process Conveyance Piping System

The process conveyance piping system to route extracted vapors from the TCH wellheads to the process treatment equipment will be installed following TCH well completion at each of the three heater groups. A ball valve will be installed as part of the TCH wellhead piping assembly. The wellhead piping will be connected to a temperature- and chemical-rated hose to allow for thermal expansion during operation. ~~A gate valve will be installed to connect the hose to the branch vapor manifold piping.~~ The vapor manifold piping will be installed on the floor and/or supported on uni-strut (or similar) pipe stands within the Former Molding Room area. The vapor manifold lines will run overhead and be routed to the exterior of the building through the western wall of the Albéa building. Scissor lifts will be used during the overhead piping installation and working from heights safety protocols will be followed during the completion of this work. The primary manifold will be equipped with drains at the low points of the piping to allow for condensate generated due to ambient cooling to be pumped to the liquid treatment system. The process conveyance piping system layout is presented in the Design Drawings (Drawing M102).

~~4.7.5~~4.7.6 ISTR Electrical Equipment

Following TCH well completion, the power and ground cabling to the heater wells and termination of cabling to a ~~network~~ group of ~~SCR controllers~~transformers will be installed inside the Former Molding Room area. The individual heater circuits ~~SCRs and their individual temperature controllers~~ will be ~~used to control~~controlled at the two PCUs located on the western side of the Albéa building ~~the heaters~~. The electrical cabling to each individual TCH well will be installed on the floor of the Former Molding Room and routed to a centralized transformer location where they will be bundled together to run overhead on cable trays. The bundled overhead cables will exit the building on the western wall of the facility. The ISTR electrical equipment layout is shown in the Design Drawings.

The electrical equipment layout for the OU3 RA construction incorporates the required clearance for normal panel access by qualified personnel per NEC Code Article 110. All of the Contractor's equipment will be installed per NFPA 70 National Electric Code Article 110.26 (Spaces Around Electrical Equipment), included but not limited to this Article are conditions of clearances to Electrical Equipment and Personnel Doors.

After completion of NFPA 70E Arc Flash study to assist with compliance of OSHA 1910 Subpart S and OSHA 1926 Subpart K, additional safety boundaries will be added if required. Building access via man door or overhead has been considered with this layout. Appropriate barricade fencing will be incorporated to limit access. In the event that servicing the equipment requires additional safety clearance, then access to the man door or overhead door on the Albéa building may be temporarily restricted.

~~4.7.6~~4.7.7 Condensate Discharge Piping System

To facilitate the transfer of liquids from the liquid treatment system holding tank to the on-site GWETS, a temporary condensate discharge line will be routed above-ground from the treated condensate holding tank to the process influent tank located inside the GWETS building. The temporary discharge line will consist of a 1-1/4 or 1-1/2-inch diameter PVC or HDPE conveyance pipe that is insulated and heat traced for cold weather operation. This conveyance pipe will be installed by the Contractor and located along the western side of the ~~grass, west of the~~ Albéa building. Where the conveyance pipe crosses the west driveway, the pipe will be ~~protected through the installation of ramps~~buried in a shallow excavation across the driveway. Piping alignment shall consider the potential for piping shift or expansion due to temperature fluctuations. Effluent offloading pumps will be installed adjacent to the effluent holding tank to transfer the liquids.

~~4.7.7~~4.7.8 Indoor Air Monitoring System

Indoor air quality will be monitored on a real-time basis during ISTR system operation at locations provided in the Design Report. Continuous indoor air monitoring will be performed using an unmanned-remotely controlled gas chromatograph (GC) equipped with an electron capture detector (ECD) and multiport analyzer provided by Groundswell Technologies (VaporSafe™). The VaporSafe™ ECD system will be installed along the northern wall of the Former Molding Room, with a total of ten separate sample collection tubing lines installed throughout the Former Molding Room and Main Production areas. The sample collection locations are shown on Figure 7. The VaporSafe™ system components will be installed, field tested, and calibrated in accordance with Section 11 11 19 of the Technical Specifications.

4.8 Equipment Decontamination

Construction equipment will be decontaminated as specified in the Technical Specifications. The Contractor will establish equipment and personnel decontamination facilities at the Site. An equipment decontamination pad will be constructed in the northern contractor laydown area (Laydown Area 1) so that all decontaminated fluids can be fully contained and captured. The decontamination pad will be approximately 8-feet by 12-feet (minimum) in size and constructed of a wood frame lined with heavy mil plastic.

Subsurface drilling equipment will be decontaminated by the Contractor before equipment is mobilized to the Site, prior to drilling a boring where sampling will be conducted, at the end of each working day, and prior to leaving the Site. Steam cleaning with a high-pressure washer will be used for decontaminating drilling equipment. The Contractor will provide plastic totes for the containerization and storage of decontamination fluids at the Site.

All equipment, tools, or other items potentially coming into contact with impacted soil will be decontaminated at various times during the progress of the work and completion of the work. During construction, decontamination will occur prior to removing contaminated equipment, tools, or other items from the work areas, as needed. Field equipment decontamination will be conducted in accordance with the Quality Assurance Project Plan, Revision 9 (Ramboll, 2018a).

4.9 Waste Handling and Disposal

Wastes generated during OU3 RA construction activities will be managed in accordance with the Waste Management Plan, which is provided in Appendix E. Wastes anticipated as part of the ISTR construction activities include construction debris, soil cuttings, decontamination rinseate, and drilling water. The construction activities are not expected to generate hazardous wastes. Should a hazardous waste stream be generated, an addendum to this plan will be submitted to the USEPA.

Coordination with the transportation contractor and disposal facility will be conducted by Ramboll in coordination with the Contractor. Ramboll will be responsible for preparing waste profiles for acceptance by the off-site disposal facility. The Contractor will be responsible for the waste transportation and off-site disposal.

Soil cuttings will be temporarily containerized in 2-yard soil hoppers in the drilling area. The drums will be hauled each day and transferred to roll-off boxes temporarily staged in the contractor staging area to the north of the building (Laydown Area 1). Drilling water will be containerized in plastic totes in the drilling area. The totes will then be transported to the on-site GWETS for treatment.

Decontamination rinsate will also be containerized in totes provided by the Contractor for treatment in the on-site GWETS. Disposable PPE used for sampling activities will be contained in trash bags and disposed of as general refuse.

Following receipt of the waste sampling results, advance notification of waste disposal activity will be provided to the USEPA prior to off-site shipment to the approved disposal facility. Shipments of the drill cuttings off-site will be manifested to meet state and federal requirements and will be managed in accordance with the Waste Management Plan contained in Appendix E.

4.10 Progress Meetings

Weekly progress meetings will be held with the Contractor's Project Manager, Ramboll Site Supervisor, and Ramboll Project Engineer during the construction of the ISTR System. PPPI's Project Coordinator for OU3, Ramboll Project Director, and USEPA may also attend some or all these weekly progress meetings. The weekly progress meetings will be scheduled by the Ramboll Project Engineer. Weekly progress meetings will discuss construction related items including, but not limited to, project status, review of CQA observations, management of change, field modifications, schedule, and overall project implementation progress.

5. CONSTRUCTION QUALITY CONTROL

CQA activities will be coordinated by Ramboll. Project monitoring will be performed based on a combination of the review for general compliance with the Final (100%) Design for OU3, submittal review, periodic project meetings, and on-site observation. The pre-construction meeting will include reviewing of the CQA roles and procedures prior to the start of the construction activities. Field CQA personnel will attend daily site meetings and participate in weekly progress meetings.

The CQA activities will be coordinated as described in the CQA Plan, in Appendix B, and the following sections describe the quality control activities, procedures for field modifications, and pre-final and final inspections.

5.1 Quality Control Activities

As part of the CQA activities, Ramboll will review technical submittals and conduct on-site observation and review of the Contractor's activities. Daily/shift meetings will be attended by the on-site crew to discuss day-to-day operations, daily schedule, health and safety matters, coordination of construction activities, and general project status.

The Contractor will conduct most of the CQA testing with oversight by the CQA officer or designated alternate. The CQA officer and/or construction managers will be responsible for scheduling observation of testing, installation oversight, inspections and for review of Contractor submittals. Field CQA may also be conducted by subcontractors engaged for their specialized knowledge of the equipment/materials to be inspected or tested.

Other CQA activities to be conducted as part of the OU3 RA will include:

- Review of submittals provided by the ISTR contractor.
- Review equipment and material deliveries to ensure they match the project specifications, drawings, and/or submittals.
- Verification that the angled borings are installed within an acceptable tolerance such that they do not substantially deviate from the locations/coordinates identified in the 3D EVS model.
- Data validation of laboratory results, such as TCE analysis of soils and summa canister air testing.
- Process piping leak testing using potable water according to Specification 40 10 00 of the Design Report.
- Periodic surveying of the settlement points before construction, during ISTR system operation, and after ISTR shutdown, as required in Technical Specification 02 21 13.
- Photographing of significant component installations.
- Reporting of testing results in the weekly progress meeting.

As part of the CQA activities, documenting the calibration and functional testing of the mechanical systems, electrical systems, instrumentation and system controls will be conducted. The checklists to be used are provided in the CQA Plan in Appendix B. Upon successful completion of functional testing, system commissioning/start-up will be scheduled. CQA activities will include verification that the tanks/vessels, heat exchangers, and cooling tower are filled to startup levels, alarms and interlocks are working, sampling procedures are in place, and safety procedures are utilized.

5.2 Field Modification Procedures and Documentation

The procedures for addressing field modifications and documentation are provided below:

- Proposals for field modifications will be submitted in writing (email is acceptable) by the Remedial Construction Contractor to Ramboll (Project Engineer or PPPI's designated representative), which has the authority and responsibility set forth to initiate field change orders with Ramboll and PPPI for approval.

- Field modifications will fall into two general categories, minor field modifications and major field modifications. Ramboll will discuss the requested field change with USACE to seek concurrence on categorizing the modification as a minor or major change and to provide additional information that may be requested to make this determination. Concurrence by the USACE on categorizing the field modification may be accomplished via e-mail or by initialing the change directive.
- Minor field modifications will be defined as any modification that does not significantly deviate from the approved design, material and performance specifications, or permit requirements of the project as determined by the Design Engineer and/or the Project Engineer. The submittals will include a discussion of any cost implications and if any cost modification to the project is necessary. If acceptable, the Project Engineer or PPPI's designated representative will prepare a change order directive and, if necessary, a cost change order. The Contractor will not proceed with the minor modification until an approved change order directive/change order is received from Ramboll.
- Major field modifications will be defined as any modification that significantly deviates from the approved design, material and performance specifications, or permit requirements of the project as determined by the Design Engineer and/or the Project Engineer. Proposals for major field modifications, will be submitted in writing by the Remedial Construction Contractor to Ramboll (Project Engineer or PPPI's designated representative), and if acceptable, will be forwarded to the USEPA and USACE for review. The submittals will include a discussion of the proposed modification and any supporting information such as drawings, calculations, plan modifications, equipment/ material specification sheets, manufacturer's data sheets, etc. that are necessary to facilitate review and approval of the proposed modification by USEPA and USACE. Upon approval of the modification by USEPA, Ramboll will prepare a change order directive/change order for the modification to be implemented by the Remedial Construction Contractor. The ISTR Contractor will not proceed with any major modification until an approved change order directive/change order is received from Ramboll.
- As construction proceeds, any major or minor modification that differs from the approved design will be recorded on the applicable "Record Set" of the design drawings that were "Issued for Construction". The "Record Set" is a redline document that will be maintained by Ramboll which documents deviations to the "Issued for Construction" drawing set. Changes to the "Record Set" will be dated and initialed by the Site Engineer and/or Remedial Construction Contractor. In the event a major modification submittal is necessary, any existing "Record Set" mark-ups that have already been completed may be incorporated into documents provided to USEPA and USACE for review of the planned modification. All field changes will be recorded in a manner to highlight the modification(s). These highlights will be retained by Ramboll throughout the construction of the project, regardless of the number of iterations. In addition to mark-ups of the construction "Record Set," all certifications, manuals, and other manufacturer documentation will be retained.
- Each change directive and the "Record Set" of drawings will be kept on file for record keeping purposes and for documenting the modification(s) in the Remedial Action Report and for preparing "As-Built" plans.

A special meeting may be held with a problem or deficiency developed. A summary of the meeting including a plan for corrective measure to address identified deficiency and follow-up actions will be documented by the CQA Officer. Following implementation of the identified corrective measures, the CQA Officer shall report to Project Engineer on the effectiveness of the corrective actions and document the measures taken for the project record.

5.3 Pre-Final and Final Inspection

At the completion of construction at each treatment group, the CQA officer or Project Engineer will schedule a pre-final inspection with USEPA. The pre-final inspection will be after successful functional testing of the equipment has been completed as approved by the Project Engineer. The USEPA and their representatives from the USACE will be notified in advance of the schedule for conducting the pre-final inspection.

The ISTR contractor will correct deficiencies noted by USEPA during the pre-final inspection and notify the Project Engineer. Upon completion of corrective actions required during the pre-final inspection, a final inspection will be scheduled with the USEPA and the USACE representatives. The start-up will not be conducted until construction is deemed complete by approval of the final inspection by the USEPA.

6. SYSTEM FUNCTIONAL TESTING AND STARTUP

Once construction activities are complete at each treatment group, operational readiness review will be held at the Site. In this meeting, the system commissioning, startup, and operational activities to be performed will be presented. The system start-up procedures are described in the project OM&M Plan in Appendix F.

Some of the commissioning tasks to be observed are included in the Construction, System and Equipment Checklists provided in the Design Report. In addition, the CQA representative will ensure that the following are completed/operational in accordance with the Design Report:

- Alarm and interlock functions;
- Alarm notification functions;
- Transfer lines have been leak-tested;
- Liquid tanks, vessels, heat exchanger, cooling tower are filled to start-up levels;
- Carbon beds are flooded and de-aerated;
- Health and safety plans are reviewed by operator(s); and
- Sampling and measurements are planned as required in the OM&M Plan. The Commissioning and startup sampling will be conducted by TRS with the assistance and oversight by Ramboll. The Ramboll CQA officer or designated alternate will document the startup sampling and measurements.

Following functional testing, the pre-final and final inspections will be scheduled and, after any deficiencies are corrected, startup of the ISTR will commence. Following startup, all final record documents will be prepared and submitted by the contractor to the Project Engineer.

7. SYSTEM OPERATION, MAINTENANCE AND MONITORING

As required by the SOW, a revised draft of the OM&M plan is provided with the RAWP (Appendix F). The OM&M Plan provides operator-level guidance for normal day to day operations, normal maintenance, data collection and management, start-up and shutdown procedures and initial field troubleshooting and operation contingency plans. The OM&M Plan provides information and procedures that will be used throughout the TCH operation period. In addition, the plan provides guidance on data management and record keeping, safety, maintenance, and troubleshooting.

TRS will be responsible for operating, maintaining, and monitoring the project system during the TCH treatment system construction, operations, and demobilization phases.

The project team will consist of TRS representatives who have been integral in the planning, development and management of the project implementation. The Project Engineer, Technical Director and Principal-in-Charge are defined in the OM&M Plan. Figure 1 of this RAWP provided the lines of authority for this project. OM&M staff training requirements for specific tasks are discussed in the OM&M Plan.

Included in the OM&M Plan (Appendix F) is the schedule for daily, weekly, and monthly liquid and vapor sampling. Sampling procedures and sampling port locations are also included. The analyses planned for each monitoring task are provided in the text of the Plan. Monitoring of the indoor air via the VaporSafe™ system is explained in the OM&M Plan. Post-remediation soil sampling system operations procedures during the soil confirmation sampling are noted in the attached OM&M Plan; however, the specific soil sampling procedures are provided in the Final (100%) Remedial Design Report. If appropriate, modifications of the OM&M Plan may be submitted to the USEPA for consideration upon completion of construction.

Long-term groundwater sampling in the OU3 Study Area is discussed in the MNA Work Plan (Ramboll Environ, April 2017). Long-term indoor air monitoring is discussed in the OM&M Plan for the Vapor Intrusion Response Activities (Ramboll Environ 2015). Based on the result of the ISTR, modification to the indoor air monitoring schedule may be requested.

8. HEALTH, SAFETY AND ENVIRONMENTAL PROTECTION MEASURES

8.1 Health and Safety Plan

The Site-specific Health and Safety Plan (HASP) for the project includes the work activities described in this RAWP and is provided as Appendix G. ~~This HASP was also included in the Final Design Report.~~

8.2 Rio Tinto Health and Safety Program

PPPI (Rio Tinto) utilizes a corporate health and safety program based on risk elimination and reduction. This project will be completed in compliance with Rio Tinto's HSEQ MS, which requires specific safety protocols and the identification of site-specific hazards and assessment to qualitatively evaluate risk.

All site workers will be trained on the site-specific HSEQ MS before starting work on the site. The safety protocols required by the HSEQ MS include daily tailgate meetings, daily vehicle inspections, daily site inspections, daily equipment inspections and some pre-work permits. A safety officer will be assigned to each work shift during construction to facilitate the program and monitor safety needs.

A qualitive risk assessment has been conducted, and hazard scenarios with associated moderate and high-risk ratings have been identified for the upcoming work. The assessment included identification of project risks in the following categories: health, personal safety, environment, community, compliance, and reputation. The identified risks will be address during construction and system operation.

In addition, the HSEQ system provides Health, Safety, and Environment Performance Standards and written procedures that provide the minimum HSE requirements that the ISTR contractor must meet when conducting work on Rio Tinto Sites.

This project will also utilize the Rio Tinto Critical Risk Management (CRM) program. This program is designed to eliminate fatalities in the work place through identification of critical risks, identification of critical controls (controls necessary to eliminate or reduce the critical risk to an acceptable level), and verification that the required critical controls are in place prior to the start of and through the duration of a given field task. There are three components of the CRM program:

- Critical Control Checklists (CCCs) are to be completed for each task whether a critical risk(s) is present.
- Critical Control Field Verification CCFV is completed by Rio Tinto or an approved Ramboll Site Safety Officer (SSO).
- Critical Control Verification Standard (CCVS) is completed by a Rio Tinto General Manager once per month.

8.3 Indoor Air Pollution Prevention

Exhaust purifiers (scrubbers) will be connected to the exhaust of each drill rig during indoor drilling activities. The scrubbers will be connected to a venting system to route the exhaust to the outside of the Albéa building through available existing roof vents.

Fumes generated from welding activities will be captured using fume exhausters of adequate size to capture all fumes generated at the welding site. The fumes will be vented directly outside the Albéa building through available existing roof vents via exhaust piping.

A temperature probe will be used to periodically measure the temperature in the exhaust piping in the building. In addition, thermometers may be placed to measure working area temperatures. A hand-held 10.6 electron volt (eV) PID [MiniRae 3000 or similar) will be used to screen indoor air vapors in the work area and in the vicinity of the drilling operations in accordance with the site health and safety plan.

8.4 Noise and Dust Controls

Noise and dust controls will be implemented during the construction of the ISTR system. Drilling, concrete cutting, and other high noise activities will be limited to the second ~~and third~~ shift period in order to minimize disruptions to routine day-to-day facility operations. A temporary noise barrier will be installed along the northwestern portion of the Former Molding Room where no partition is present at this location. The noise barrier will be constructed ~~using sound blankets attached to a temporary wall/fencing panels or by hanging/attaching the sound blankets to the building frame/structural supports~~ using metal studs and gypsum wall board on each side with therma-fiber insulation. Noise from construction equipment, vehicles, and activities associated with exterior site operations will be monitored using a sound level meter in accordance with Section 01 57 19 of the Technical Specifications.

Daily cleaning protocols will be implemented as needed. Dust controls will be implemented when drilling temperature monitoring point T-14, VMP-4, VMP-5, and the vertical treatment volume verification soil borings inside the Main Production Area. Drilling at this location will use a plastic sheeting (Visqueen™) dust control enclosure around the drilling rig.

8.5 Emergency Plan

The on-site emergency coordinator will be the Ramboll Construction Manager and/or Site Safety Officer. The Construction Managers will be responsible for checking that the Contractor has the equipment and plans in place and/or available to implement the activities listed in the Contingency Plan, which is provided in Appendix H. This includes emergency first aid supplies, spill kits, backup generator, backup pumps, and backup PLC battery.

9. PERMITS

9.1 Ramboll Permitting Activities

Ramboll will complete the following activities related to permitting for the OU3 RA: air discharge permitting, discharge to groundwater permit equivalency, and electric power supply permitting.

9.1.1 Air Discharge

A preconstruction permit, certificate to operate, and permit for construction of a new source will be sought by Ramboll for discharge of treated vapors from the ISTR system. An application for modification to the existing PPPI air permit equivalency (PI No. 85714) will be prepared and added to the equivalency as a new source of emissions.

9.1.2 Discharge to Groundwater Permit Equivalency

The addition of treated condensate water to the GWETS will warrant notification to the NJDEP for acceptance and/or authorization to add this discharge to the GWETS's current Discharge to Groundwater (DGW) Permit-by-Rule Equivalency. This request for discharge authorization will be prepared by Ramboll.

9.1.3 Electric Power Supply

Connection of the ISTR system to the 34.5 kV transmission line requires a detailed process of design activities, agreements and coordination between the engineer/owner and utility. Ramboll is working with First Energy to obtain a permit to make this connection and to determine the required interrupting device (e.g., breaker, circuit switcher or fuses) that will be required at the transmission line connection. In addition, the necessary electrical permit will be sought by TRS for a temporary electrical service connection to their site support trailer.

9.2 Contractor Permitting Activities

The Contractor will be responsible for obtaining the NJDEP well construction permits and local construction and building permits associated with the OU3 RA.

9.2.1 NJDEP Well Construction Permits

The application for new heater/vapor extraction wells and temperature monitoring points will be submitted to the NJDEP for approval by a licensed driller employed by TRS, the installation contractor. This will include a variance needed from NJDEP to allow for the use of ~~9~~6-inch diameter borings to be used for the collocated TCH and VEW well design.

9.2.2 Local Construction and Building Permits

The New Jersey Department of Community Affairs (NJDCA), Washington Borough and the Town of Washington will be notified of the proposed construction of temporary wall, HVAC modifications, the piping/headers/manifolds, cabling, power distribution equipment, site support trailer, and electrical service installation prior to implementing the work. Construction permits will be applied for in accordance with local requirements by TRS and Ramboll.

10. ISTR SYSTEM DECOMMISSIONING

Once it is determined that the RG has been achieved and the draft Performance Verification Report is approved by the USEPA (see Section 11.3), the ISTR system will be shut down and decommissioned. The decommissioning activities will include the abandonment of the TCH wells and thermocouples, removal of process equipment, and site restoration. These activities are to be completed by the Contractor in accordance with Section 01 94 00 of the Technical Specifications and are described further in the following sections.

10.1 TCH Well Abandonment

The TCH wells will be decommissioned by first removing the wellheads, heaters and liners, meter runs, associated electrical cables, and monitoring hardware from each well. The wellhead equipment and heater cans will be decontaminated in accordance with the QAPP (see Section 4.8) prior to being removed from the Site. Once the well equipment has been removed, each TCH well will be abandoned in accordance with NJDEP requirements, using ~~heat-resistant cement grout (i.e., type G) below 40 feet bgs and~~ a standard bentonite cement grout ~~above that depth~~ to approximately 2 feet beneath the building slab, followed by patching of the floor penetrations with concrete to match the existing thickness. Depending on the size of the concrete patch work required at each of the TCH well locations (i.e., TCH well cluster trenches), reinforcing of the concrete patch will be conducted as necessary.

10.2 Thermocouple Abandonment

The TMPs will be decommissioned by first removing the thermocouples and any associated instrumentation from each location. The thermocouples will be decontaminated in accordance with the QAPP (see Section 4.8) prior to being removed from the Site. Each TMP borehole will then be abandoned in accordance with NJDEP requirements, using ~~heat-resistant cement grout (i.e., type G) below 40 feet bgs and~~ a standard bentonite cement grout ~~above that depth~~ to approximately 2 feet beneath the building slab, followed by patching of the floor penetrations with concrete to match the existing thickness.

10.3 Process Equipment Removal

Following USEPA's approval that the RG has been met, the process equipment, electrical service lines, and interconnected piping and hardware will be removed from the Site as part of the ISTR system decommissioning. The vapor extraction and treatment system and liquid treatment equipment components will be disconnected from all electrical and piping connections. All process equipment components and interconnected piping components will be decontaminated as specified in Section 4.8 prior to removal from the Site. An all-terrain forklift will be used to load the skid-mounted process equipment components onto a flatbed trailer for off-site transport and removal from the Site.

10.4 Site Restoration

Following decommissioning, interior and exterior site restoration activities will be performed. Such activities will include the removal of any remaining equipment, tools, excess material, and temporary facilities, inclusive of the site trailers, temporary utilities, and site security fencing and barriers. During this time, any treatment equipment remaining on-site will be decontaminated in preparation for demobilization. All tools, spare parts, extra materials, permanent locks, and keys will be delivered to the construction manager upon demobilization. Additional Site restoration activities will include removal of decontamination areas and contractor staging and support areas.

A final cleaning of the Former Molding Room and exterior support and process equipment areas on the west side of the facility building will be performed as part of site demobilization. Debris and

surface dust will be removed, and concrete floors will be swept clean. All trench excavations and borehole locations on the interior of the facility building will be patched with concrete.

All remaining wastes, rubbish, trash, or debris will be removed from the Site and properly disposed of in accordance with applicable laws, ordinances, and regulations. Paved areas will be broom cleaned. Any petrochemical spills, stains, or other foreign deposits will be cleaned.

11. REMEDIAL ACTION REPORTING

This section documents the reporting to be completed as part of the OU3 RA. For each deliverable discussed in this section, an electronic copy and two bound copies will be submitted to USEPA, and an electronic copy will be provided to the NJDEP. In addition, electronic copies of each deliverable will be provided to USEPA's oversight contractor (USACE).

11.1 Soil Treatment Volume Confirmation Sampling Results

Results from analysis of soil samples from boreholes to the north (north of PDI-SB33) and south (south of PDI-SB32) of the identified impact area ~~at Clusters 1, 14 and 15~~ will be available after the standard (non-expedited) laboratory turn around period (7 to 10 business days). These boring locations are shown on Figure D-3 of the Field Sampling Plan in Appendix D~~were depicted in the Design Report~~. When available, the reported TCE concentrations in the soils from 75 to 120 feet below floor surface in a boring will be tabulated and reported to the USEPA project manager and the USACE support group via email. A boring location map and the preliminary laboratory report (prior to validation) will be presented also. A project status conference call to discuss the results will be scheduled if requested by the USEPA. After completion of the soil borings~~a cluster~~, a summary table of ~~all~~ the borings ~~in the cluster~~ and boring logs will be provided. As appropriate, the EVS model will be updated with the new soil sample results to re-evaluate the EVS-modeled edge of the TCE impact zones.

11.2 Monthly System Operations Reporting

Systems operations will be evaluated and reviewed weekly and any recommendations deemed necessary to improve the effectiveness of the remedial system (i.e., modifications to the energy input balance, adjustment in vapor extraction system flow rates, and process treatment system modifications) will be communicated to the USEPA in conference calls as necessary. The information gathered from the above tasks for evaluating remedial progress and system performance will be documented in monthly O&M reports and submitted to the USEPA. The effectiveness of the ISTR system in achieving the design objectives will also be reviewed and summarized in the monthly O&M reports.

In general, the monthly O&M reports will include the following:

- brief descriptions of maintenance activities and/or adjustments to the system;
- results from vapor samples collected during the period of operation;
- systems operational data including average TTZ temperatures, simplified energy balance, estimates of TCE mass removed to date, volume of condensate generated/discharged, and performance of the process effluent treatment systems;
- performance of the vapor intrusion mitigation system; and
- results from the indoor air quality (VaporSafe™) monitoring system.

The monthly O&M reports will be submitted following receipt and validation of vapor samples submitted for laboratory analysis during the operational reporting period. Notice of the intent to

shut down the ISTR system will be communicated to the USEPA in advance and will be based on the multiple lines of evidence approach described in further detail in Section 11.3.

11.3 Performance Verification Report

Following successful demonstration that the multiple lines of evidence data indicate that *de minimis* concentrations of TCE in subsurface soils have been reached, a petition to shut the system down will be presented to the USEPA in a draft Performance Verification Report and submitted to USEPA for approval. The report will document the results of the ISTR system monitoring and multiple lines of evidence that support demonstration of achievement of the RG. Based on these results, a recommendation will be made in the report on whether post ISTR soil confirmation sampling is necessary to further demonstrate that the ROD remedial goals have been achieved. Advanced notification of the intent to submit the draft Performance Verification Report will be provided, to the extent possible, to ensure timely review and approval by USEPA.

After the USEPA approves the draft Performance Verification Report, the TCH heater wells will be turned off and the extraction and process treatment systems will continue to operate to extract and treat vapors to allow for partial cool down and to capture steam and vapors still present in the subsurface. During this cool down phase, subsurface temperature and pressure monitoring will continue. This cool down phase is expected to last approximately 21 days and if necessary, post ISTR soil confirmation sampling would be initiated during this period.

11.4 Remedial Action Report

Pursuant to Section XII.B.1 of the OU3 SOW, a draft RA Report will be prepared and submitted to the USEPA for review and approval. The draft RA Report will provide a summary of the work performed during the thermal treatment system installation and operation and will also include results from the one round of post-remediation groundwater and indoor air monitoring discussed in the OM&M Plan. The draft RA Report will be submitted within 60 days of validation of the post-remediation groundwater and indoor air sampling analytical results. The draft RA Report will include a certification statement, signed by a responsible corporate official of Ramboll, which states the following:

> *"To the best of my knowledge, after thorough investigation, I certify that the information contained in or accompanying this submission is true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."*

12. SCHEDULE

A detailed time schedule for RA activities for OU3 is provided as Figure 8. The schedule incorporates the major tasks presented in this RAWP.

13. REFERENCES

Ramboll Environ. 2017. Final Groundwater Extraction and Treatment System Operation, Maintenance, and Monitoring Plan; Operable Unit (OU) 1 – TCE Groundwater; Pohatcong Valley Groundwater Contamination Superfund Site; Warren County, New Jersey. March.

Ramboll US Corporation. 2018a. Quality Assurance Project Plan (Revision 9), OU1 (TCE Groundwater), OU2, OU3, and Vapor Intrusion Removal Action, Pohatcong Valley Groundwater Contamination Superfund Site, Warren County, New Jersey. February.

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USEPA. 1986. Superfund Remedial Design and Remedial Action Guidance. OSWER Directive 9355.0-4A. June.

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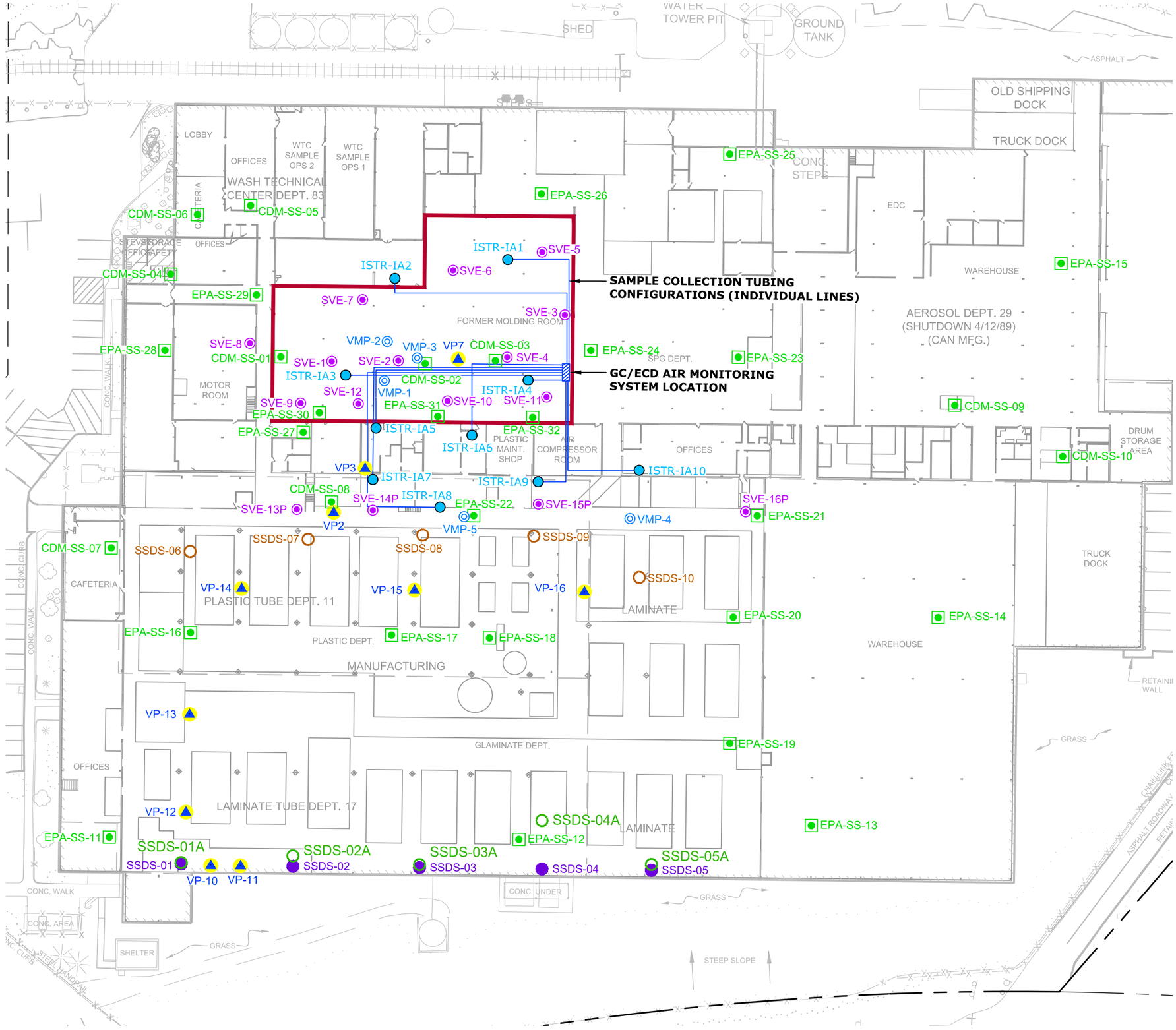
USEPA. 2017. Statement of Work for Implementation of the Operable Unit 3 (OU3) Remedial Design and Remedial Action, pursuant to the Consent Decree entered in United States v. Pechiney Plastic Packaging, Inc., (PPPI), 09-cv-5692 and United States v. Bristol-Myers Squibb Co., et al., 13-cv- 5798. June.

TABLE

FIGURES



L:\Loop Project Files_CAD\1690014983_ISTR System Design Mods-Updates to RAWP_003\7_Indoor Air Monitoring Locations During ISTR.dwg

LEGEND

- SOURCE AREA
- EPA-SS — SUB SLAB VAPOR MONITORING POINT (INSTALLED BY OTHERS)
- VP — SUB SLAB VAPOR MONITORING POINT (INSTALLED BY ENVIRON)
- SVE — SVE/SSDS EXTRACTION POINT
- SSDS — WEST WALL SUB SLAB DEPRESSURIZATION EXTRACTION POINT (STANDBY SSDS POINT)
- SSDS — EAST WALL SUB SLAB DEPRESSURIZATION EXTRACTION POINT
- ISTR — PROPOSED INDOOR AIR MONITORING LOCATION DURING ISTR OPERATION WITH GC/ECD SYSTEM
- VAPOR MONITORING PROBE

0 60
SCALE IN FEET

INDOOR AIR MONITORING LOCATIONS DURING ISTR

POHATCONG VALLEY GROUNDWATER CONTAMINATION SITE
OPERABLE UNIT (OU) 3
WARREN COUNTY, NEW JERSEY

RAMBOLL

FIGURE 7

DRAFTED BY: ELS	DATE: 11/8/19	1690014983

APPENDIX A
Electrical Contractor Certifications

TRS Group, Inc.
Accelerating Value

TRS Group, Inc.
PO Box 737
Longview, WA 98632

www.thermalrs.com

TRS Group, Inc. – Competent/Authorized Person Declaration

Definition

A competent person is a person having the ability to recognize the existing and predictable hazards and having the authority to correct them.

Responsibility

The designated TRS Group, Inc. (TRS) competent person is responsible for recognizing and correcting the safety risks/hazards for the tasks they are assigned to complete. The Competent Person has the authority to stop work when a potential safety concern arises on any project site.

Acknowledgement

I, as an employee-owner of TRS Group, Inc., have been assigned to perform the listed tasks at an *in situ* thermal remediation (ISTR) project site. I have been trained and observed by senior staff personnel to be a Competent Person or Authorized person in the areas indicated below. I acknowledge that the I have been thoroughly trained and am experienced in hazard recognition and have the authority and the responsibility to stop work and correct hazards in the event of a potential hazardous or imminent danger situation.

Kevin Riffe — *TRS Employee-Owner (Printed)*

11-6-19 — *(Date)*

TRS Employee-Owner (Signature)

TRS Supervising Employee-Owner (Printed)

(Date)

TRS Supervising Employee-Owner (Signature)

TRS Competent Person

- X General Safety and Health
- X HAZWOPER
- X First Aid/CPR
- X Fire Protection and Prevention
- X PPE
- X Hazard Communication
- X Air Monitoring
- X Respiratory Protection
- X General Electrical
- X Electrical Equipment Maintenance
- X Lock-Out/Tag-Out
- X Aerial Lifts
- X Fall Protection
- X Cranes/Critical Lifts
- X Signaling
- X Motor Vehicles
- X Forklift/Skid Steer
- X Ladders and stairways
- X TRS CSP
- X Site-Specific HASP
- X General Construction
- X Basic Hand Tools
- X Trenches/Excavations
- X Site Supervisor
- X Concrete Construction

TRS Authorized Person

- X High Voltage Inspection
- X ISTR System Startup
- X ERH Voltage Testing
- X Hot Groundwater Sampling
- X Hot Soil Sampling
- X Steam-Laden Vapor Sampling
- X SERT
- X ISTR Element Fabrication
- X Drilling Oversight

TRS Group, Inc.
PO Box 737
Longview, WA 98632

www.thermalrs.com

TRS Group, Inc. – Competent/Authorized Person Declaration

Definition

A competent person is a person having the ability to recognize the existing and predictable hazards and having the authority to correct them.

Responsibility

The designated TRS Group, Inc. (TRS) competent person is responsible for recognizing and correcting the safety risks/hazards for the tasks they are assigned to complete. The Competent Person has the authority to stop work when a potential safety concern arises on any project site.

Acknowledgement

I, as an employee-owner of TRS Group, Inc., have been assigned to perform the listed tasks at an *in situ* thermal remediation (ISTR) project site. I have been trained and observed by senior staff personnel to be a Competent Person or Authorized person in the areas indicated below. I acknowledge that the I have been thoroughly trained and am experienced in hazard recognition and have the authority and the responsibility to stop work and correct hazards in the event of a potential hazardous or imminent danger situation.

JEFF RIFFE — *TRS Employee-Owner (Printed)*

11/6/19 — *(Date)*

TRS Employee-Owner (Signature)

TRS Supervising Employee-Owner (Printed)

(Date)

TRS Supervising Employee-Owner (Signature)

TRS Competent Person

- ✓ General Safety and Health
- ✓ HAZWOPER
- ✓ First Aid/CPR
- ✓ Fire Protection and Prevention
- ✓ PPE
- ✓ Hazard Communication
- ✓ Air Monitoring
- ✓ Respiratory Protection
- ✓ General Electrical
- ✓ Electrical Equipment Maintenance
- ✓ Lock-Out/Tag-Out
- ✓ Aerial Lifts
- ✓ Fall Protection
- ✓ Cranes/Critical Lifts
- ✓ Signaling
- ✓ Motor Vehicles
- ✓ Forklift/Skid Steer
- ✓ Ladders and stairways
- ✓ TRS CSP
- ✓ Site-Specific HASP
- ✓ General Construction
- ✓ Basic Hand Tools
- ✓ Trenches/Excavations
- ✓ Site Supervisor
- ✓ Concrete Construction

TRS Authorized Person

- ✓ High Voltage Inspection
- ✓ ISTR System Startup
- ✓ ERH Voltage Testing
- ✓ Hot Groundwater Sampling
- ✓ Hot Soil Sampling
- ✓ Steam-Laden Vapor Sampling
- ✓ SERT
- ✓ ISTR Element Fabrication
- ✓ Drilling Oversight

APPENDIX B
Construction Quality Assurance Plan

APPENDIX C
Traffic Management Plan

Prepared for
Pechiney Plastic Packaging, Inc.
South Jordan, Utah

Submitted to
United States Environmental Protection Agency, Region II
New York, New York

Prepared by
Ramboll US Corporation

Date
November 2019

Project Number
1690008019

DRAFT TRAFFIC MANAGEMENT PLAN

OPERABLE UNIT 3, POHATCONG VALLEY GROUNDWATER CONTAMINATION SUPERFUND SITE WARREN COUNTY, NEW JERSEY

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Suite 2700
Chicago, IL 60606
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www.ramboll.com

RAMBOLL

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FIGURES

ATTACHMENTS

ACRONYMS AND ABBREVIATIONS

DOT	Department of Transportation
OU	Operable Unit
Plan	Traffic Management Plan
PVGCS Site	Pohatcong Valley Groundwater Contamination Superfund Site
PPPI	Pechiney Plastic Packaging, Inc.
Ramboll	Ramboll US Corporation
TCE	trichloroethylene
USEPA	United States Environmental Protection Agency

1. INTRODUCTION

On behalf on Pechiney Plastic Packaging, (PPPI), Ramboll US Corporation (Ramboll) has prepared this Traffic Management Plan (the "Plan") associated with the Operable Unit 3 (OU3) in-situ thermal remediation (ISTR) System Construction activities to be implemented at the Albéa facility at 191 Route 31, Washington New Jersey, starting in late 2019. The work is described in the USEPA-approved OU3 Remedial Action Work Plan dated July 2019.

The ISTR activities are part of remediation of the Pohatcong Valley Groundwater Contamination Superfund Site (the "PVGCS Site"). The PVGCS Site is located in Warren County, New Jersey and is identified by the United States Environmental Protection Agency (USEPA) as ID# NJD981179047.

1.1 Purpose

The purpose of this Plan is to provide the information needed to coordinate the vehicle, equipment, and personnel traffic during the ISTR system construction. This Plan addresses the proposed routes used by drilling equipment, construction equipment, delivery trucks, all contractors and visitors, and pedestrians entering, leaving, and navigating the area. All traffic control aspects contained within this Plan will be maintained throughout the entire period of ISTR system construction and operation. This plan is to ensure the safe movement of traffic and personnel around the work areas, provide maximum protection and safety to site workers, contractors, visitors, and local area residents. Details describing the Plan are presented in the sections below.

2. PRE-OPERATIONAL SAFETY INSPECTION

2.1 Vehicle Pre-Trip Inspection

All personnel traveling to the job site shall perform and complete a vehicle inspection check list. Drivers of light vehicles will conduct a vehicle inspection and record any deficiencies prior to traveling every day. If the deficiency is deemed to present a significant hazard, the vehicle will be tagged out-of-service until it can be repaired. At the end of each month, the driver will submit the completed daily inspection form to Ramboll's Site Safety Officer for documentation.

Drivers of materials and equipment delivery trucks will conduct vehicle inspection per Department of Transportation (DOT) vehicle inspection requirements.

All drivers are required to have valid state-issued driver's licenses for the type of vehicle they operate and up-to-date training/certification for operating heavy equipment and/or mobile equipment.

2.2 Permits for Oversize or Overweight Vehicles

Each state DOT requires vehicles and loads that exceed legal size or weight limits to apply and be in possession of oversize/overweight permits prior to transportation. Interstate permits will be required if the vehicle travels through multiple states to reach its final destination. In the event that the vehicle is both oversize and overweight, two permits may be required. Drivers should comply with routes of travel, speed limits, exact date, and time of operation designated by the Motor Vehicle Commission. All other state DOT statutes pertaining to oversize or overweight vehicle transportation, such as escort vehicle requirements, hazard warning signs, warning flags, head lamps, and tail lamps shall be followed.

3. TRAFFIC MANAGEMENT

All project-related traffic is subject to the Rio Tinto Vehicles and Driving Standard (Document HSEC-B-15). All vehicles proceeding to the work areas or designated storage area(s) for the purpose of conducting work or making deliveries are to follow all posted rules of the road, as well as those detailed in this Plan. The posted speed limit for the Albéa parking lots is 10 miles per hour (mph). There will be no tolerance for illegal or unsafe actions. Rendezvous locations and pre-approved escort routes for material and heavy equipment will be defined during the kick-off meeting.

3.1 Site Areas

A specific access route has been established for the site, including material staging/ equipment/ laydown/ trailer areas. The primary contractor laydown area will be at the north end of the property. The contractor trailer area will be west of the building. This area will include the contractor tool storage, the contractor office trailer, and contractor's sanitary facilities. The Ramboll trailer will remain in the Albéa lot south of the facility parking lot. This area will be used for waste material roll offs, as a secondary contractor laydown area, and primary parking for all non-essential or non-construction related vehicles. A map of the designated storage/equipment areas, with overhead utility clearances, is provided as Figure C-1.

The Work Instruction Procedure (WIP) for transporting beneath high voltage power lines shall be strictly followed. This WIP is included with this Plan as Attachment A. A map of the project areas overhead electric line is provided as Figure C-1. Additional overhead electric lines will be installed as part of the ISTR construction activities and will be located near the south end of the building at the Albéa gate entrance. As specified in the WIP:

- If the distance between the height of the high voltage electric power line and the planned transit location is less than 20 feet, a Close Proximity Permit will be required prior to transit beneath.
- If the distance between the height of the high voltage electric power line and the planned transit location is less than 6 feet, transit beneath is not allowed without a conference call and authorization by Rio Tinto's Principal Advisor, in addition to the Close Proximity Permit.
- If the distance between the height of the high voltage electric power line and the planned transit location is greater than 6 feet but less than 10 feet, transit beneath is only allowed with a master spotter and two spotters to ensure the truck and load maintains the 6-foot minimum distance from the power lines, and a Close Proximity Permit.
- If the distance between the height of the high voltage electric power line and the planned transit location is greater than 10 feet, transit beneath is allowed with a Close Proximity Permit and a spotter to ensure the truck and load maintains a 10-foot minimum distance from the power lines.

3.1.1 Albéa Delivery Traffic

A sign indicating "Caution Overhead Electrical Wire" will be placed at the south end of the building at the Albéa gate entrance. Contractor will be directed to maintain an open lane for Albéa resin delivery truck traffic arriving from the north Route 31 entrance and proceeding around the north end of the building and along the west side of the building to the resin storage silos. Signage indicating construction areas, possible pedestrian traffic, and revised driveway route will be installed. Full-size barricades will be placed at both ends of the resin delivery truck route along the west side of the building, one barricade near the north staging area and one barricade at the south end of the building at the Albéa gate entrance for any trucks that my come in from this direction. A "slow" sign will also be added to the barricades. Resin

deliveries will be coordinated with Albéa and resin delivery trucks will be escorted along the west side of the building.

3.1.2 Project Traffic

All construction heavy equipment delivery and semi-trucks/trailers will require an escort. Vehicles making delivery of material and equipment will alert Ramboll of their expected arrival and be escorted to the appropriate area.

Ramboll and contractor personal and light weight commercial vehicles will enter from the southern Route 31 entrance and enter the designated project parking area at Ramboll's trailer. This area is one-way, proceeding from east to west past the Ramboll trailer, as shown on Figure C-1. Signage indicating "Construction Entrance" and "Construction Exit Do Not Enter" will be posted at the entrance and exit, respectively, and a stop sign will be located at the Ramboll trailer area. Drivers and operators shall be aware of project workers and Albéa facility employees walking or driving near this area.

All vehicles will be parked in the secondary laydown area near the Ramboll trailer unless it is necessary for the vehicle to be parked elsewhere. Additional parking areas will be determined on an as needed basis by the Ramboll Site Supervisor.

TRS personnel may proceed to the contractor trailer and storage area shown west of the facility building on Figure C-1 with vehicles used to support construction activities. Drill rig, support trucks, and bobcat route to the work area is around the west side of the building to an entrance on the north side of the building as shown on Figure C-1. This route will be used for deliveries to the Equipment Laydown Areas also.

Fuel for the drill rigs and other equipment, which will be stored in a covered and fenced area near the north staging area, will be delivered into the molding room via a rollup door on the north side of the building.

The WIP for transport of diesel fuel shall be strictly followed. This WIP is included with this Plan as Attachment B. As specified in the WIP:

- Bulk diesel fuel tank needs to meet or exceed the RT E-15 document (Hazardous materials and non-mineral waste control and minimization). The mobile tank used to transport from bulk storage into the molding room will be double-walled or have a secondary containment and be no more than 100 gallons in size.
- Make sure a spill kit is readily available and a fire extinguisher is nearby at the bulk tank storage area and in the Molding Room.
- A spotter will walk in front of the forklift on the way to/from the molding room to control all intersections and other traffic (pedestrians and mobile equipment). The spotters roll will be to assist the forklift through congested areas and to make sure other traffic is controlled to prevent quick stops and intersection collisions.

3.1.3 OU3 Work Area Inside Albéa Building

Deliveries and equipment access to the molding room in the Albéa Building will be from the north entrance. No support truck traffic is allowed in the building. Supplies/materials will be transported by propane-fueled or battery powered forklift. Forklifts are required to drive the speed limit inside the building, which is 5 mph, slow down and honk at all intersections, and watch for pedestrians and other

traffic. The interior access route is shown on Figure C-2. In addition, the WIP for working in Albéa molding room shall be strictly followed and is included with this Plan as Attachment C.

4. TRAFFIC CONTROLS

4.1 Ramboll Trailer Area

In addition to the site trailer, a secondary staging area (roll-off boxes if needed) and sanitary facilities will be present in the Ramboll Trailer Area in the south parking lot. This area may be surrounded by a chain link fence to limit trespass. All drivers and operators shall be cautious when approaching this area and other areas of limited visibility. Additional traffic controls may be employed, as necessary.

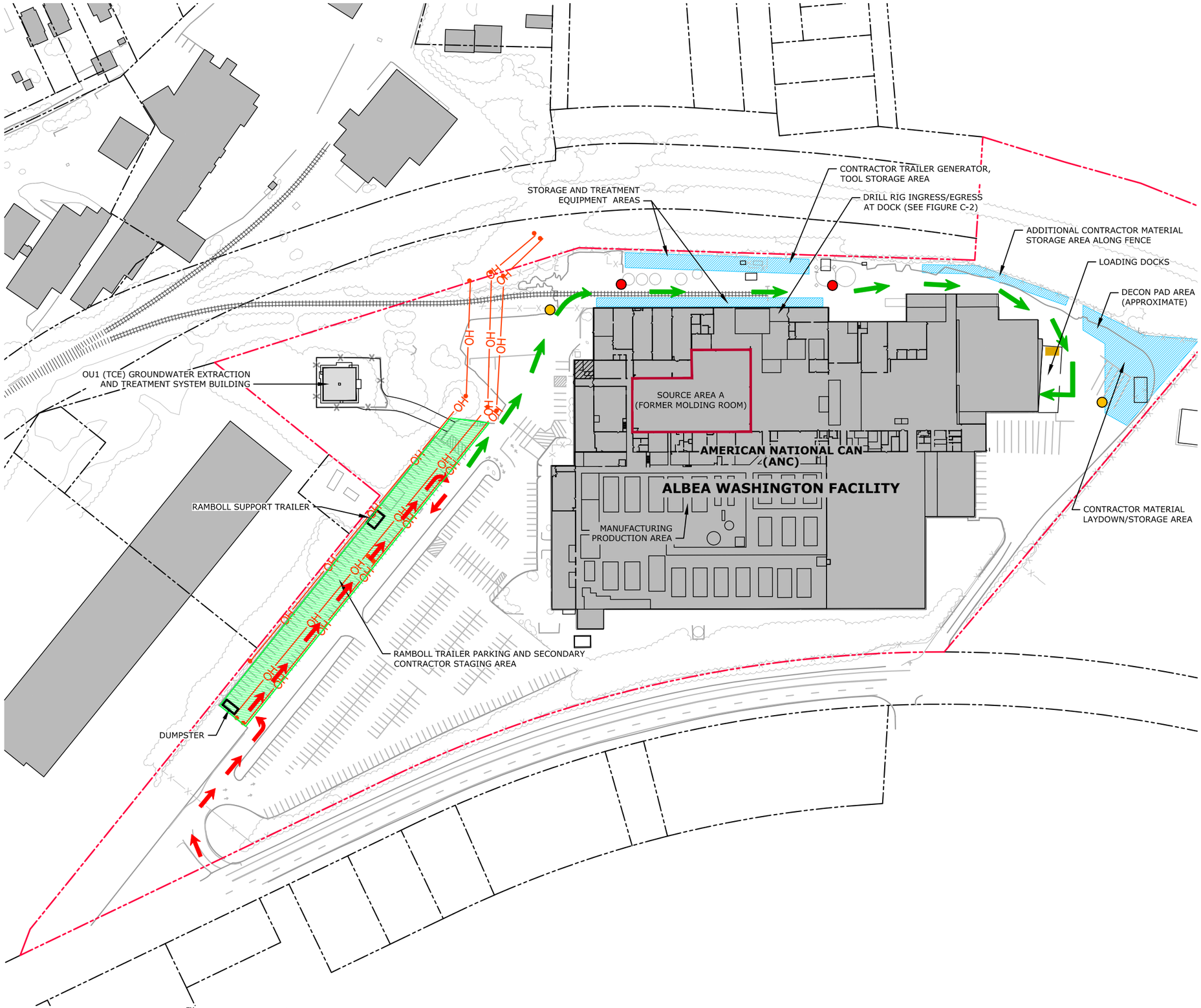
4.2 Contractor Trailer Area

The contractor trailer area will be located west of the Albéa facility building as shown on Figure C-1. The contractor will be required to keep the west side access driveway clear for truck traffic throughout the construction and operation of the ISTR system. Signage will be installed at the north and south edges of the contractor trailer areas. All drivers and operators shall be cautious when approaching this area as the air/liquid treatment, electrical, condensate storage, and associated piping are located near the contractor trailer areas.

4.3 Channeling Devices

Channeling devices, such as cones, signage, or barricades may be used to route traffic as needed. No contractor parking is allowed on the north side of the building. Changes in traffic/routes will be discussed during the preconstruction meeting and daily safety meeting as appropriate. The safety tailgate form will be used to document traffic management changes.

FIGURES



LEGEND

- OU3 BOUNDARY (APPROXIMATE)
- RAMBOLL TRAILER PARKING AND SECONDARY CONTRACTOR STAGING AREA
- DELIVERY AND PERSONNEL VEHICLE TRAFFIC ROUTE
- FORKLIFT AND ESCORTED EQUIPMENT/ MATERIAL DELIVERY ROUTE
- OH — OVERHEAD ELECTRIC LINE
- STOP SIGN
- CONSTRUCTION AREA (SLOW) SIGN

Note:

1. Albea daily deliveries will enter the north driveway an turn around at loading dock area.
2. Albea resin deliveries will enter south driveway and turn around near resin silos.

0 150

SCALE IN FEET

SOURCE: AERIAL IMAGERY: GOOGLE EARTH™, IMAGE DATED xx/xx/201x.

TRAFFIC PLAN AND PROJECT FACILITY LAYOUT

POHATCONG VALLEY GROUNDWATER CONTAMINATION SUPERFUND SITE
OPERABLE UNIT (OU) 3
WARREN COUNTY, NEW JERSEY

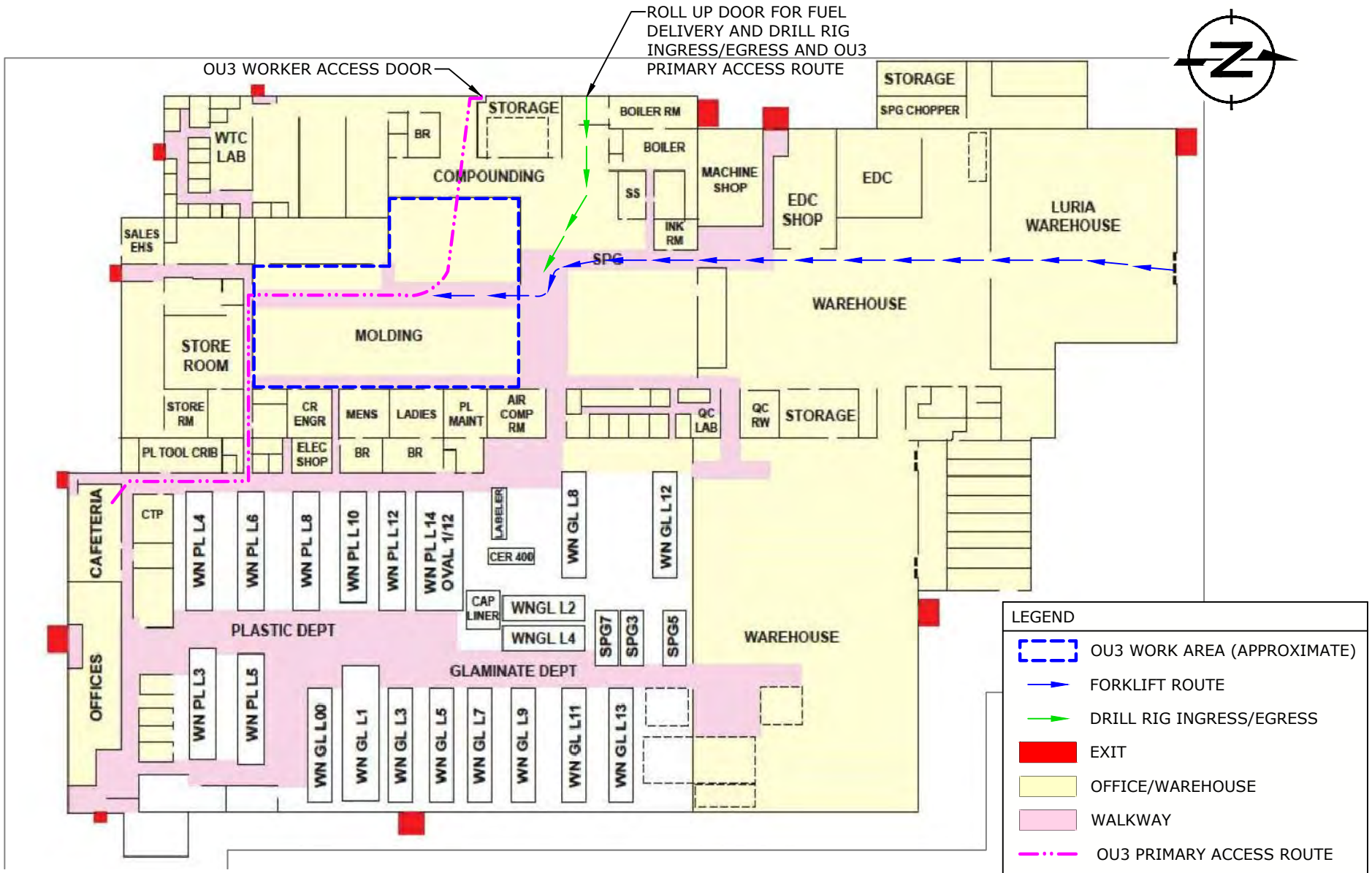
RAMBOLL

FIGURE **C-1**

DRAFTED BY: ELS/CKL	DATE: 7/11/19	1690008019

L:\Loop Project Files_CAD\1690008019_RT_WBS_010\OU3 RA Workplan\C-1_Traffic Plan & Facility Layout (OU3).dwg

L:\Loop Project Files_CAD\1690008019_RT_WBS_010\OU3 RA Workplan\02_Interior Access Route-OU3 Work Area (OU3).dwg



Site map from Albea Washington Plant - Contractor Saftey Package Rev 18 (September 7, 2017).

RAMBOLL

DRAFTED BY: ELS | DATE: 7/25/19

INTERIOR ACCESS ROUTE - OU3 WORK AREA

POHATCONG VALLEY GROUNDWATER CONTAMINATION SUPERFUND SITE
OPERABLE UNIT (OU) 3
WARREN COUNTY, NEW JERSEY

FIGURE
2

1690008019

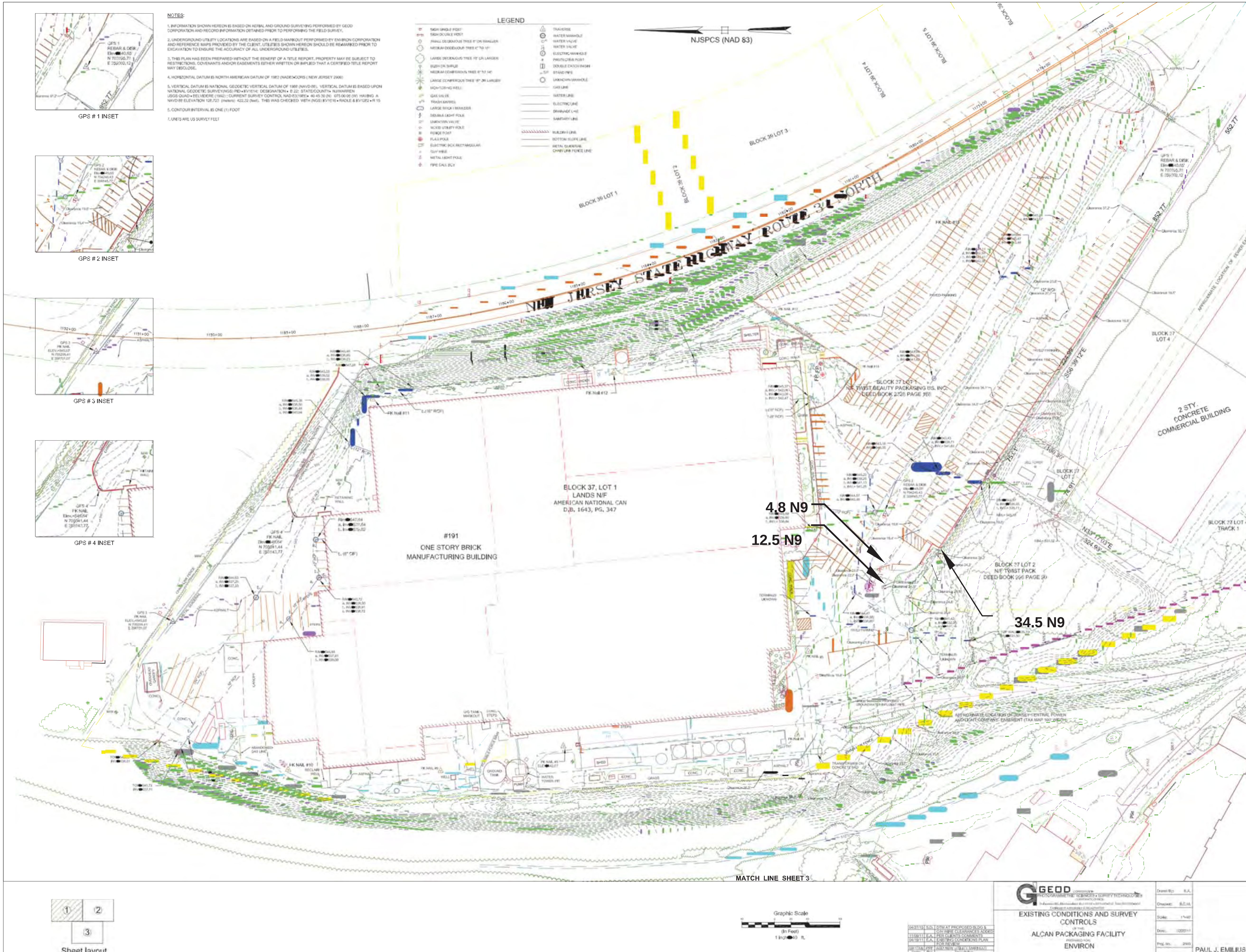
ATTACHMENT A
WORK INSTRUCTION PROCEDURE – TRANSPORTATION OF EQUIPMENT OR SUPPLIES BENEATH HIGH VOLTAGE (34.5 KV) ELECTRIC POWER LINES

Work Instruction Procedure

Project Name: Remedial Action Construction, OU1 (TCE), PVGCS Site
Work Location: Albea Property, 191 Route 31 North, Washington, NJ
Description of the Work Task: Transportation of equipment or supplies beneath high voltage (34.5 KV) electric power lines.

Procedure Prepared by: *Michael Eddings, Date* **Prepared: 7***/8/2015* Update February 2018/CB
Procedure Reviewed by: *Bruce Kennington, Date* **Prepared:** *7/24/2015*
Procedure Approved by: *Bruce Kennington, Date* **Approved:** *7/27/2015*

	Describe the job step-by-step so it is able to be clearly understood by anyone required to do this job
Step 1	Check with the power company (Jersey Central Power and Light; Charles Benner 908-689-6959) to determine if shielding is available for the duration of tasks that will require low clearance transport of equipment and supplies.
Step 2	While meeting delivery truck at rendezvous point, verify that the daily (photograph or copy) truck inspection from DOT log book or complete a truck inspection form before the truck moves onsite.
Step 3	Refer to the drawing "Existing conditions and survey controls" with the surveyed heights of the high voltage (34.5 KV) electric power lines for the location the equipment or supplies plan to transit beneath.
Step 4	Verify the height of equipment or supplies (including the truck or trailer and load). If clearance is less than 20 feet, a "Close Proximity Permit" will be required to be obtained prior to passage beneath the lines is allowed.
Step 5	If clearance (i.e., between the height of the equipment with load and the height of the high voltage electric power lines at the planned transit location) is less than 6 feet, no movement of the equipment or supplies beneath the power lines will be permitted until authorization is obtained following a "GO/NO GO" conference call held with the project team, including the contractor Site Supervisor, the contractor Site Safety officer, the Ramboll Senior Construction Manager, the Ramboll Site Manager, and the Rio Tinto Principal Advisor HSE.
Step 6	If the clearance of the truck and load is determined to be greater than 6 feet but less than 10 feet, a master spotter with two spotters will be used to ensure the truck and load maintains the 6-foot minimum distance from the power lines.
Step 7	If clearance of the truck and load is greater than 10 feet, a single spotter will be used to help ensure the truck and load maintains a 10-foot minimum distance from the power lines.
	Describe the hazards likely to be encountered when doing the job (From pre-task hazard assessment or risk assessment)
	Slips, trips and falls while observing/walking the truck or trailer beneath the power lines.
	Equipment or supplies come in contact with the power lines.
	Electrical shock to spotters or driver if procedures are not followed.
	Describe how the hazards are going to be controlled (Use of HSE Performance Standards or other procedures)
	Drivers will be escorted on Site by Ramboll or contractor authorized personnel
	Rio Tinto Performance Standard C3 - Vehicles and Driving
	Use of spotters to maintain/verify the load will pass beneath the power lines while maintaining the required minimum distance from the power lines.
	No personnel will be allowed to ride on the trailer or in equipment while driver of the truck passes beneath the power lines.
	Driver will not be allowed to exit the truck until the load has cleared the power lines.
	Drivers will be required to use the appropriate PPE when unstrapping the equipment/supplies. (Hard hat, safety glasses, gloves, steel toe boots)
	List training or competencies required
	General electric safety
	Knowledge of working with/near heavy construction equipment and trucks
	Contractor Indoctrination Training for the Site
	Operator loading or unloading of the equipment/supplies will be qualified on the specific equipment used.
	List PPE Required
	Non-Conductive hard hat
	High-visibility vest
	Steel-toe boots
	Safety glasses
	List any precautions, notifications or permits required
	Must understand other site activities and associated hazards
	Must pay attention to location of truck/trailer while watching the power line clearance
	Must pay attention to ground surface while watching truck and power line clearance
	All personnel on Site will be informed of the movement of equipment or supplies at the daily tailgate meeting.
	Personnel performing tasks in the area of the movement of equipment/supplies will also discuss the associated hazards and controls during the Take-5 meetings.
	Delivery trucks may be asked to provide a copy of the DOT log book inspection section.
	An equipment inspection will be performed before the equipment will be placed in service.
	If clearance is less than 20 feet a "Close Proximity Permit" will be required to be obtained prior to passage beneath the lines is allowed.
	Emergency Action Procedure
	Move away from the equipment that has come in contact with the electric power line(s). Driver or operator should remain within the vehicle.
	If a high voltage line has been broken, move away from the line. **DO NOT CROSS.**
	CALL 911.....DO NOT ATTEMPT A RESCUE. THE FIRE DEPARTMENT RESCUE TEAM WILL DO WHAT IS NEEDED TO SAFELY EXTRACT AFFECTED PERSONNEL or EQUIPMENT.



NOTES:
LEGEND
NJSPCS (NAD 83)
GPS # 1 INSET
GPS # 2 INSET
GPS # 3 INSET
GPS # 4 INSET
NEW JERSEY STATE HIGHWAY ROUTE 31 NORTH
BLOCK 36 LOT 1
BLOCK 36 LOT 2
BLOCK 36 LOT 3
BLOCK 36 LOT 4
BLOCK 37, LOT 1
LANDS N/F
AMERICAN NATIONAL CAN
D.B. 1643, PG. 347
#191
ONE STORY BRICK
MANUFACTURING BUILDING
BLOCK 37 LOT 1
N/F TWIST BEAUTY PACKAGING US, INC.
DEED BOOK 2326 PAGE 166
BLOCK 37 LOT 2
N/F TWIST PACK
DEED BOOK 256 PAGE 30
BLOCK 37
LOT 4
2 STY.
CONCRETE
COMMERCIAL BUILDING
BLOCK 37 LOT 8
TRACK 1
4.8 N9
12.5 N9
34.5 N9
MATCH LINE SHEET 2
MATCH LINE SHEET 3
Sheet layout
Graphic Scale
GEOD
EXISTING CONDITIONS AND SURVEY CONTROLS
ALCAN PACKAGING FACILITY
ENVIRON
Borough of Washington
Warren County
New Jersey
PAUL J. EMILIUS Jr.

ATTACHMENT B
WORK INSTRUCTION PROCEDURE – TRANSPORT OF DIESEL FUEL

Work Instruction Procedure

Project Name: Remedial Action Construction, OU3(TCE), PVGCS Site
Work Location: Albea Property , 191 Route 31 North, Washington, NJ
Description of the work task: Transport of diesel fuel to the molding room and the refueling of the drilling equipment

	Describe the job step-by-step so it is able to be clearly understood by anyone required to do this job
Step 1	Bulk diesel fuel tank needs to meet or exceed the RT E-15 document (Hazardous materials and non-mineral waste control and minimisation). The mobile tank will be double-walled or have a secondary containment and be no more than 100 gallons in size. Make sure a spill kit is readily available and a fire extinguisher is nearby at the bulk tank storage area and in the Molding Room. Verify all fuel pumps and hoses are in proper working order on bulk fueling tank
Step 2	Pick up mobile tank with forklift and strap down the tank to secure it for transport.
Step 3	Fill the mobile tank with diesel fuel. Be sure to not overfill. If overfill or other leakage occurs, clean off the tank before transporting into the facility.
Step 4	After mobile tank is filled, properly secured, and clean it is ready to proceed toward the north roll up door of the facility. Make sure a spill kit is readily available and a fire extinguisher is nearby during transport into the building.
Step 5	A spotter will walk in front of the forklift on the way to the Molding Room to control all intersections and other traffic (pedestrians and mobile equipment). The spotters roll will be to assit the forklift through congested areas and to make sure other traffic is controlled to prevent quick stops and intersection collisions.
Step 6	Once in the Molding Room, and before fueling of the drilling equipment starts, verify the spill kit is readily available and the location of fire extiguishers in the Molding Room.
Step 7	Turn drilling equipment off. Begin fueling equipment.
Step 8	After fueling is complete, clean up any spills, drips, etc from equipment and fuel tank.
Step 5	A spotter will walk in front of the forklift on the way out of the Molding Room to control all intersections and other traffic (pedestrians and mobile equipment). The spotters roll will be to assit the forklift through congested areas and to make sure other traffic is controlled to prevent quick stops and intersection collisions.

Describe the hazards likely to be encountered when doing the job(From pre task hazard assessment or risk assessment)
Overfilling causes spill and catches on fire and/or creates slip conditions.
Slips, trips, and falls while escorting the forklift to/from the Molding Room.
Tank not properly secured and sudden stops or turns causes the tank to be dropped, spilling fuel onto the ground or inside the building.
Forklift strikes pedestrian or object while moving to/from the Molding Room.

Describe how the hazards are going to be controlled (Use of HSE Performance Standards or other procedures)
Pay attention for the level in the tank or equipment being filled refueled.
Use of spotters to maintain traffic control at intersections and congested areas.
Training and competency of personnel involved in refueling activities.
Have spill pad, pan, etc to catch any spill that might occur while fueling.
Have fire extinguisher nearby in case of fire.
Honking the horn of the forklift while moving through the facility.

List training or competencies required
Forklift training
Knowledge of working with/near heavy construction equipment and trucks
Contractor Indoctrination Training for the site
Fire extinguisher use awareness and training
Operator loading or unloading of the equipment/supplies will be qualified on the specific equipment used.

List PPE Required
Hard hat
High-vis vest
Steel toe boots
Safety glasses
Gloves

List any precautions, notifications or permits required
Must understand other site hazards (construction of treatment system, operating plant)
Must pay attention to ground surface while acting as spotter.
An equipment inspection will be performed before equipment is placed in service.

Emergency Action Procedure
For minor spill - Contain and clean up with spill kit. Report spill.
For major spill - Contain fuel as to not get into a receptor. Call for assistance. Report spill.
For small fire - Use a fire extinguisher to put out fire. Report the incident.
For large fire - Evacuate the area or building. Call 911. Notify the appropriate onsite personnel. Report the incident.

ATTACHMENT C
WORK INSTRUCTION PROCEDURE – WORKING IN ALBÉA MOLDING ROOM

Work Instruction Procedure: Working in Albea Molding Room

Project Name: PVGCS Site
Work Location: Albea, 191 Route 31 North, Washington, NJ
Description of the work task: Construction and installation of treatment system and drilling activities
Date: Nov 2019

	When working in the Albea molding room, workers must adhere to the following:
1	All Ramboll/subcontractors must sign the Ramboll sign-in sheet during the start-of-shift tailgate meeting or upon entering the building.
2	The sign-in sheet must be in a location in the OU3 work area that is designated by Albea and is readily accessible to bring to the rally point in the event of a plant evacuation.
3	Ramboll and subcontractors shall complete Albea's Contractor Check List at least for every 10-day shift. The checklist must be kept with the daily sign-in sheet.
4	All Ramboll//subcontractors will be given a Ramboll subcontractor badge that is to be worn when inside the Albea building in lieu of the Albea visitor sticker.
5	All Ramboll/subcontractors will access the OU3 work area using the door by the SVE system if not traversing with a drill rig or forklift.
6	All Ramboll/subcontractors are to park in the parking lot to the Ramboll field trailer. Parking is prohibited in the main Albea parking lot, on the east side of the back driveway, and in the north canopy area. Standing on the east side of the back driveway and/or in the north canopy area for short term deliveries are allowed. Parking on the west side of the back driveway may be allowed with permission from the Ramboll field manager.
7	All Ramboll/subcontractors will be restricted to the Molding Room, the restrooms (east of Molding Room), and the lunch room (southeast of Molding Room). However, in December 2019 only, work in the production area will be allowed during scheduled drilling activities.
8	All Ramboll/subcontractors must wear a hairnet and, if applicable, a beard net at all times while inside the facility (except lobby). Standard PPE (safety glasses, steel toe boots, hard hat, hi-vis vest, and hearing protection) shall be worn in the OU3 work area also. Note, contact lenses and jewelry are not allowed in the Albea plant. See attached checklist for Albea PPE requirements.
9	All Ramboll/subcontractors are prohibited from eating/drinking/chewing in the Molding Room or any other Albea indoor area except the lunchroom. Bottled water in a clear container is allowed.
10	Part of Albea's Hygiene Plan includes washing hands before leaving bathrooms.
11	Personal use of cell phones is not allowed in the plant. Smoking is allowed only at the Albea smoke hut east of the plant.
12	All Ramboll/subcontractors are to evacuate the plant upon the signal and move to the rally points.
13	The OU3 work area's exclusion zone is to be clearly marked by signs or cones or tape to warn Albea employees to stay out.
14	Dust generation will be minimized. No mixing of grout is allowed inside the building. Use dust controls as needed and/or if requested by the Ramboll field manager.

Describe the hazards likely to be encountered when doing the job (From pre task hazard assessment or risk assessment)
Hazards include drilling hazards as listed elsewhere, tripping over exhaust hoses, interior forklift traffic, 2nd shift work (low light/fatigue), TCE from subslab, cold stress, heat stress, dust generation, diesel exhaust, welding fumes/UV radiation and fire.

Describe how the hazards are going to be controlled (Use of HSE Performance Standards or other procedures)
Engineering controls: Work area demarcation. Use water to control dust. Exhaust ventilation. Use welding screens/curtains/blankets. Fire watch. LOTO.
Administrative controls: Limit work hours as agreed with Ramboll and Albea (hours may be different depending on the task). Sign in and out with Ramboll site safety officer. Park in approved parking zones. Use designated access routes to Molding Room. No grout mixing inside the building. Maintain daily sign-in sheet and weekly Albea checklist as required.
Personal protective equipment (PPE): See below.

List training or competencies required
Site-specific Contractor Indoctrination Training. NJ-licensed drillers. Licensed/trained electricians. Trained equipment operators.
Daily toolbox meeting to discuss changing conditions or requirements.

List PPE Required
Standard PPE: Hard hat, steel-toed boots, long pants, safety glasses, gloves, hi-vis vest, and (properly rated) hearing protection, where required
Personal fall arrest when required. Welding gloves/helmet when required.
Albea additional PPE requirements (see attachment for full list): All contractors must wear hair net and, if applicable, beard net at all times while inside the facility (except lobby). Contact lenses are not allowed in the Albea plant. Jewelry, including watches is not allowed in the Albea plant.

List any precautions, notifications or permits required
Isolation permit. Hot work permit (30 to 90 minute fire watch). Working from heights permit.
Conduct SSC for all subsurface work.
Questions? Contact the Michael Eddings, Ramboll On-site Field Manager. Albea contact for OU3: Felix Miranda 908-619-2159 or Russell Gladd 908-674-1479.

APPENDIX D
Field Sampling Plan

Prepared for:
Pechiney Plastic Packaging, Inc.
South Jordan, Utah

Submitted to:
United States Environmental Protection Agency Region II
New York, New York

Date:
~~July~~November 2019

Project Number:
1690008019

DRAFT FIELD SAMPLING PLAN

OPERABLE UNIT 3, POHATCONG VALLEY GROUNDWATER CONTAMINATION SUPERFUND SITE WARREN COUNTY, NEW JERSEY

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RAMBOLL

CONTENTS

FIGURES

ATTACHMENT

ACRONYMS AND ABBREVIATIONS

AC1	Area of Concern 1
°C	degree Celsius
°F	degree Fahrenheit
Albéa	Albéa Americas, Inc.
ANC	American National Can
AST	aboveground storage tank
bgs	below ground surface
CD	Consent Decree
DL	drain lines
EB	equipment blank
EDD	electronic data deliverable
EQuIS	Environmental Quality Information Systems
eV	electron volt
EVS	Earth Volumetric Studio
FB	field blank
FSP	Field Sampling Plan
GWETS	Groundwater Extraction Treatment System
HASP	Health and Safety Plan
ISTR	in-situ thermal remediation
mg/kg	milligram per kilogram
MPA	Main Production Area
MS/MSD	matrix spike/matrix spike duplicate
OM&M	Operation, Maintenance, and Monitoring
OU	Operable Unit
PCE	tetrachloroethene
PDI	Pre-Design Investigation
PID	photoionization detector
PPE	personal protective equipment
PPPI	Pechiney Plastics Packaging, Inc.
PVGCS	Pohatcong Valley Groundwater Contamination Superfund
QA	quality assurance
QAPP	Quality Assurance Project Plan
QC	quality control
RA	Remedial Action
RAWP	Remedial Action Work Plan
RD	Remedial Design
RG	remedial goal
RI/FS	Remedial Investigation/Feasibility Study

ROD	Record of Decision
Site	Pohatcong Valley Groundwater Contamination Superfund Site
SOG	standard operating guideline
SOP	standard operating procedure
SOW	Statement of Work
SSD	Sub-slab Depressurization
SSDS	Sub-Slab Depressurization System
TB	trip blank
TCE	trichloroethene
TCH	thermal conductive heating
TCLP	Toxicity Characteristic Leaching Procedure
TTZ	target treatment zone
USCS	Unified Soil Classification System
USEPA	United States Environmental Protection Agency
VIRA	Vapor Intrusion Remedial Action
VMP	~~vacuum~~ vapor monitoring ~~point~~probe
VOC	volatile organic compound
VTC	Vikon Tile Corporation
WLY	Warren Lumber Yard

1. INTRODUCTION

Ramboll US Corporation (Ramboll) has prepared this Field Sampling Plan (FSP) for Source Area A of Operable Unit (OU) 3 of the Pohatcong Valley Groundwater Contamination Superfund (PVGCS) Site, hereinafter referred to as the "Site," located in Warren County, New Jersey (United States Environmental Protection Agency [USEPA] identification number NJD981179047). This FSP was prepared on behalf of Pechiney Plastics Packaging, Inc. (PPPI) for the remedy selected by the USEPA to address trichloroethene (TCE) impacts in deep vadose zone soils for OU3 (Source Area A).[1] The FSP is submitted in compliance with Section IX of the USEPA-approved Statement of Work (SOW)[2] for OU3 and the Consent Decree (CD)[3] and presents the field sampling procedures and methodology required for collecting the necessary data to evaluate attainment of the remedial goal (RG) and objectives identified in the USEPA Record of Decision (ROD)[4] for OU3 (Source Area A).

1.1 Objective

This FSP describes the sampling activities associated with the pre-and post-operation of the *in-situ* thermal remediation (ISTR) system including final performance verification sampling needed to provide confirmation of RG achievement. The FSP will be used in conjunction with the February 2018 Quality Assurance Project Plan (Revision 9) (QAPP), Waste Management Plan (included as Appendix ~~G~~E of the ~~Final (100%)~~ Remedial ~~Design Report~~Action Work Plan [RAWP}), and Site-specific Health and Safety Plan (HASP) developed for the ISTR remedy (included as Appendix ~~K~~G of the ~~Final (100%) Remedial Design Report~~RAWP). The complementary QAPP and HASP provide the quality assurance (QA) and quality control (QC) and health and safety procedures that will be used throughout the project to ensure that consistent and documented means, methods, and practices are implemented for the work. The Waste Management Plan provides details and specific information on the management and disposal of investigation-derived wastes that will be generated during implementation sampling activities. This FSP describes the specific field sampling activities that will be conducted to collect the required data to provide verification of successful performance and completion of the soil remedial activities for OU3 Source Area A. These data will be incorporated into the Remedial Action Completion Report, which is a subsequent deliverable under the USEPA-approved SOW for OU3.

1.2 Document Organization

This FSP is organized into eight sections. Section 1 (this section) introduces this FSP, summarizes the intent, and references the complementary QAPP and HASP. Section 2 describes the Site history and geologic/hydrogeologic setting. Section 3 provides details of the field sampling methods and activities to be performed during construction of the OU3 remedy relating to the confirmation of the extent of TCE impacts >1 milligram per kilogram (mg/kg) within the Main Production Area (MPA) of the Albéa Americas, Inc. (Albéa) Washington facility, and to verify the performance of the selected remedy in meeting the remedial goals and objectives. Section 4 provides the nomenclature to be used for sample identification. Section 5 describes the procedures for conducting field measurements, field quality control, and decontamination of equipment in accordance with the project QAPP. Section 6 specifies the

[1] The remedy selected by USEPA for the treatment of soils in OU3 Source Area A is in-situ thermal remediation (ISTR) via thermal conductive heating (TCH).

[2] USEPA approval of the OU3 Statement of Work in a letter dated June 26, 2017.

[3] In the matter of United States of America v. PPPI (Civil Action No. 09-cv-05692) and United States of America v. Bristol Myers Squibb Company, et. al. (Civil Action No. 13-cv-05798) effective March 11, 2015.

[4] USEPA Record of Decision – OU3 Study Area dated September 30, 2016.

recordkeeping that will be done to document sample collection, custody, and shipping. Section 7 discusses the management of investigation derived wastes. Section 8 includes a list of references used in the preparation of this FSP. Field standard operating procedures (SOPs), laboratory analytical methods, and QA/QC procedures are specified in the QAPP. Additional ISTR specific standard operating guidelines (SOGs) and SOPs specifically developed for sample collection for ISTR operations and not included in the QAPP are described in Section 3 and Attachment 1.

2. BACKGROUND

This section provides background information on the Site including the location, Site history, and geologic and hydrogeologic setting of the Site.

2.1 Site Location

The PVGCS Site encompasses an area of about 16.5 square miles (10,600 acres) that extends about 8.5 miles along the length of the Pohatcong Valley, which is a northeast-southwest trending valley bounded by mountains. The location of the PVGCS Site is shown in Figure D-1. The Site is divided into three operable units. Operable Unit 1 (OU1), which covers about 8.75 square miles extending about 5 miles along the Pohatcong Valley, is defined by the USEPA as the study area established to address TCE and tetrachloroethene (PCE) contaminated groundwater within Washington Borough, and parts of Washington and Franklin Townships. Operable Unit 2 (OU2) is defined by the USEPA as the portion of the Site downgradient from OU1 where TCE is present in groundwater. The OU3 Study Area is located in Washington Borough and is defined by the USEPA as the area that has been identified as the source area for TCE within the aquifer. The OU3 Study Area comprises four properties known as: American National Can (ANC), Area of Concern 1 (AC1), Vikon Tile Corporation (VTC), and Warren Lumber Yard (WLY) properties. A site map showing the location of OU3 is presented on Figure D-2.

The currently active facility on the ANC property consists of one main building, which houses administrative offices, production facilities, raw and waste materials storage areas, and warehouse shipping and receiving operations for the current property owner, Albéa. The eastern portion of the ANC property consists of unused, vegetated land that borders State Highway 31. The northern portion of the ANC property is a shipping and receiving area that includes loading docks, equipment storage areas, and raw materials and drum storage. A local control panel and four injection wells for discharge of treated effluent from the Groundwater Extraction and Treatment System (GWETS) for OU1 (TCE in groundwater) are also located at the north end of the ANC property. To the west of the ANC building is a paved area that contains raw material storage silos, a water tower, an aboveground storage tank (AST) and pump house for the fire suppression system for the facility, electrical distribution equipment, a fifth injection well for the GWETS, and the sub-slab depressurization blower shed and off-gas treatment equipment for the sub-slab vapor intrusion mitigation system installed as part of the Vapor Intrusion Remedial Action (VIRA) in 2013.

Source Area A within OU3 has been defined as the soils beneath the southwestern portion of the ANC building, also known as the Former Molding Room Area inside the building and drain lines (DL) DL-9 and DL-10, which connect to discharge structures on the down slope portions of the ANC property and originate in the Former Molding Room Area of the ANC building (USEPA, 2016a). Recent Pre-Design Investigation (PDI) activities conducted from March to June 2018 within the Former Molding Room Area and from December 24, 2018 to January 1, 2019 in the MPA located east of the Former Molding Room identified that soil impacts are located beneath a majority of the Former Molding Room Area and also extend to the east and beneath the MPA of the facility.

2.2 Site History

In 2011, the USEPA initiated OU3 Study Area Remedial Investigation/Feasibility Study (RI/FS) activities to determine the nature and extent of contamination. The RI included an evaluation of potential human health and ecological risks based on Site-related contamination in soil, sediment, surface water and indoor air. As a result of these activities, the USEPA issued a ROD for OU3 in September 2016. As provided in the OU3 ROD and SOW, the major components of the USEPA-selected remedy for OU3 include the following:

- The implementation of deep soil vapor extraction and/or thermal treatment to address deep soil contamination underlying the former ANC building.
- Long-term operation and maintenance of the existing shallow sub-slab depressurization (SSD) system within the former ANC building.
- Long-term groundwater and indoor air monitoring in the OU3 Study Area.
- Continued implementation of institutional controls, including the existing deed notice, and amendment to reflect the components of the selected remedy for OU3 that will be implemented at the former ANC property.

PPPI is conducting the remedial activities at the PVGCS Site pursuant to the CD that became effective on March 11, 2015. The OU3 Source Area A soil treatment portion of the project is being performed in accordance with the OU3 SOW, which defines the requirements for implementation of the Remedial Design (RD), the Remedial Action (RA), and Operation, Maintenance and Monitoring (OM&M) Plan for OU3. The OU3 SOW was approved by the USEPA on June 26, 2017, and incorporated into the CD.

During Summer 2013, as part of the VIRA, a vapor mitigation system consisting of shallow sub-slab soil vapor extraction points was installed in the Former Molding Room Area and MPA to mitigate exposure to TCE vapor inside the building. The SSD System (SSDS) description, installation, and operation, maintenance, and monitoring are described in the OM&M Plan for the vapor intrusion response activities at the Albéa Washington facility (Ramboll Environ, 2015).

2.3 Site Geology and Hydrogeology

The PVGCS Site is located within the Pohatcong Valley, which falls within the Reading Prong portion of the Highlands Physiographic Province, locally referred to as the New Jersey Highlands Province. This province is characterized by northeast-southwest trending ridges and valleys of Late Precambrian metamorphic and igneous rocks, and Early Palaeozoic carbonate rock.

The Pohatcong Valley trends northeast-southwest and is bounded on the southeast and northwest sides by regional faults (the Pohatcong Thrust Fault along the southeast side and the Brass Castle Thrust Fault along the northwest side). A third fault (the Karrsville Thrust Fault) is suspected to be present along the Valley floor. The topographic ridges to the southeast and northwest of the Valley floor are both formed from relatively hard and erosion-resistant igneous and metamorphic rocks of Precambrian Age that were thrust up in the area during the Paleozoic Era. The Valley floor is underlain by Early Paleozoic (Cambrian and Ordovician) units that are primarily composed of carbonate rocks (limestones and dolomites) of the Jackson Limestone and the Kittatiny Supergroup. The Kittatiny Supergroup includes the Leithsville Formation, Allentown Dolomite, Lower Beakmantown Group, and the Upper Beakmantown Group. The upper part of the Valley where the existing groundwater extraction and treatment system is operated is underlain by the Leithsville Formation, which is characterized as an approximately 1,000-foot thick unit that consists of dolomite, calcitic dolomite, and phyllite with thin beds of dolomite-cemented quartz. This formation and the other bedrock formations located farther down the Valley contain numerous karstic

features (i.e., sinkholes, caves, large fractures, and cavities) and are primarily composed of carbonate units that readily form karst.

The carbonate rocks under the Valley floor are overlain by unconsolidated sedimentary deposits of glacial origin, primarily glacial till, glacial moraine, and glacio-fluvial deposits that range in thickness from about 40 feet near the boundary between OU1 and OU2 (i.e., down valley) to about 100 feet near the northeastern boundary of OU1. These glacial deposits are generally characterized as a heterogeneous and poorly sorted mixture of gravel, sand, silt, and clay. In most areas, this material has a low permeability and is primarily composed of clayey silt. Slightly greater permeability is encountered in some strata that contain silty sand and gravel lenses.

The glacial till, moraine and fluvial unconsolidated overburden deposits immediately below the building are characterized as predominantly silt to approximately 88 feet below ground surface (bgs) to 109 feet bgs. The silt coarsens downward often becoming sandier towards the bedrock interface. The silt is characterized by having trace cobbles and boulders, is dry, and hard. In some boreholes, a cobble or boulder layer was encountered. These layers ranged in length and depth. The shallowest boulder/cobble layer was encountered around 16 feet bgs while the deepest cobble/boulder layer was encountered around 90 feet bgs. Below the silt overburden, weathered dolostone/limestone bedrock is encountered.

Groundwater in the Pohatcong Valley is found in perched zones within the unconsolidated deposits and in a regional aquifer in the deep overburden and bedrock. Although some perched water zones are present, they do not represent a significant source of groundwater for the region; are generally isolated from each other; and do not form one coherent aquifer. The regional bedrock stratum is primarily composed of fractured and karstic dolomite. Groundwater in the regional aquifer is generally encountered at a depth of approximately 80 to 120 feet bgs in the northern part of OU3 where active remediation is proposed and at progressively shallower depths farther down valley (i.e., towards the southwest). The depth to groundwater at POHMW12R located within OU3 Source Area A ranges from approximately 120 feet bgs to 129 feet bgs.

3. FIELD SAMPLING PROGRAM

The field sampling program presented in this FSP includes activities associated with pre-and post-remediation sample collection for final ISTR performance verification. Data collected from the field activities described herein will support the performance evaluation of the remedy and provide confirmation of RG achievement. Details on the OM&M activities associated with the ISTR system operations and performance monitoring to be conducted during active remediation are presented in the OM&M Plan (Appendix ~~H~~F to the ~~Final (100%) Remedial Design Report~~RAWP).

3.1 Soil Sampling During ISTR System Installation

To confirm the extent of the soil TCE impacts >1 mg/kg to the south of PDI-SB32 and to the north of PDI-SB33, which is currently defined by the Earth Volumetric Studio (EVS) model output using the data from the PDI conducted during the plant shutdown on December 24, 2018 through January 1, 2019, soil samples will be collected from two to four soil borings~~during installation of two of the angled ISTR thermal conductive heating (TCH) boring clusters installed beneath the MPA~~. One to two borings will be installed at the north and south ends of the plume edge for a total of two to four borings. ~~Soil sampling will be performed in the approximate areas of TCH boring Cluster #1 and #15 shown on Drawing C102 – Wellfield Layout contained in Appendix D of the Final (100%) Remedial Design Report.~~ The proposed locations of the initial soil borings to the north and south are shown on Figure D-3. Rotosonic drilling

methods will be used to advance a core-barrel to the target depth interval for soil sample collection. Soil samples will be collected between the depths of 75 to approximately 120 feet bgs using the same sampling methods and procedures during the PDI ~~at each angled boring comprising the cluster~~. The soil sampling procedures to be used for soil sample collection are described in detail in the Pre-Design Soil Sampling and Analysis Plan (Ramboll, 2018b). These data will be used to verify the EVS modeled extent of the TCE impacts south of PDI-SB32 and north of soil boring PDI-SB33, and to ensure that the remedy is sufficiently designed to treat the soil volume exceeding 1 mg/kg at these two locations.

Soil samples collected from the drilling operations will be analyzed using a fixed-base laboratory with results requested on a 2 or 3-day turn-around time. The laboratory will analyze the soil samples for volatile organic compounds (VOCs) and percent moisture and will be used to make decisions on delineation in the field without delay or stand-by of drill rigs and personnel.

3.2 Post-Treatment Soil Verification Sampling

Once ISTR system performance monitoring data indicate that the remedy is near or at completion based on performance metrics such as temperature, energy input, and vapor sampling results and if additional empirical data are requested by the USEPA to demonstrate that the RG has been met, post-treatment soil verification sampling activities will be conducted. The post-treatment soil sampling locations, means and methods, and sample collection procedures are described in further detail in the following subsections.

3.2.1 Sampling Locations

If post-remediation soil sampling is requested by the USEPA, up to ~~three~~ two soil borings will be installed within each of the three heater Groups (Group A, Group B and Group C) for a total of up to six post-remediation soil borings. Draft locations (which may be adjusted in the field) for post-remediation soil sample borings are shown on Figure D-4. For the post-remediation soil sampling performed within the area of the Group A and Group B heaters (if needed), borings are proposed be installed when access can be secured during a planned facility shutdown in the Main P~~p~~roduction Area~~operations~~. For the post-remediation soil sampling performed within the area of the Group C heaters (if needed), borings will be located within the 10-foot wide access corridor located within the Former Molding Room Area ~~at the approximate locations depicted on Figure D-3~~. Each post-remediation soil boring depicted on Figure D-~~3~~4 will be installed vertically (90° angle from horizontal) and drilled to the base of the target treatment zone (TTZ) (approximately 120 feet bgs) or until competent bedrock is reached, whichever is shallowest.

3.2.2 Soil Sampling Means and Methods

Prior to conducting intrusive activities, utility mark-outs will be coordinated through the New Jersey One Call System and Ramboll will coordinate utility identification and clearance activities with Albéa. To identify subsurface utilities and confirm their location prior to initiating any intrusive work, Ramboll will complete geophysical surveys (e.g., using ground-penetrating radar and electromagnetic conductivity) of the areas where intrusive activities will occur (i.e., soil boring installation, underground work).

Upon completion of the geophysical utility clearance efforts, all soil boring locations will be cored through the concrete with a wet rotary diamond coring method to control dust particulates. The cores will be advanced through the concrete floor and be left in place until the locations are ready to be advanced as soil borings. An air knife or hand clearing will be used to clear the upper approximately 5 feet of each boring prior initiation of sonic drilling. Advancement of soil borings will be completed through the use of sonic drilling methods using a 4-inch core barrel and 6-inch override casing. In this configuration, a 5-foot soil core barrel (4-inch diameter) is advanced to collect the soil core and is then overridden with the 6-inch casing. Once the casing is overridden, the soil core is removed and provided to the field geologist for logging and soil sampling. The soil core barrel will be advanced without the use of a drilling

fluid to limit impact to soil sample collection. If denser units are encountered (i.e., rock or boulders) several mitigation measures to reduce the impact on analytical samples from the drilling process will be performed. These include shorter sampling intervals and specialized drive buffers that limit heat generation. The override casing will be advanced using a minimal amount of water. This is necessary to clear the annular space between the 4- and 6-inch casing and to reduce friction. All fluids will be contained and disposed in appropriate containers (55-gallon drums and/or roll-off containers) for disposal in accordance with the Waste Management Plan contained in Appendix G in the Final (100%) Remedial Design Report.

After soil boring activities are complete, a Professional Land Surveyor registered and licensed in New Jersey will survey the soil boring locations. The horizontal location and vertical elevation of each boring will be surveyed utilizing the current State Plane Coordinate System (North American Datum of 1983) and vertical elevation datum (NGVD 88).

3.2.3 Soil Sample Collection Procedure

Due to the elevated soil temperatures resulting from the TCH operations, soil borings completed for post-treatment soil verification sampling will follow the hot soil sampling procedure presented in Attachment 1. Soil samples from the TTZ will be continuously logged for classification, soil characteristics (e.g., texture, color), and screened using a 10.6 electron volt (eV) photoionization detector (PID) to evaluate the concentration of total organic vapors present. Downhole tooling and soil extracted at depth must be handled appropriately with temperature rated personal protective equipment (PPE). Soil samples collected via roto-sonic are typically brought to the surface and extracted into polyethene sleeves. Prior to soil extraction into polyethene sleeves, the polyethene sleeve will be tested against the steel core-barrel to verify temperature tolerance. If polyethene sleeves are not tolerant of the soil temperatures, a split core barrel or aluminium liner will be used.

Once the soil has been extracted from the core sample barrel, the soil sample contained in a plastic sleeve, split core barrel, or aluminium liner will be sealed at both ends and placed in an ice bath to reduce the soil temperature. To reduce the loss of VOCs, soil samples will be in the ice bath no longer than 3 hours.

When the soil sample has reached approximately 50 degrees Fahrenheit (°F) (10 degrees Celsius [°C]), or the sample has been chilled for 3 hours, the soil will be inspected, logged by a geologist to include a description of the soils using the Unified Soil Classification System (USCS), and screened for VOCs with a PID equipped with a 10.6 eV lamp. Soil characteristics, lithologies, and PID readings will be recorded on soil boring logs or a bound field book in accordance with the SOP included in the QAPP.

Based on recovery, a minimum of two soil samples will be collected from each 5-foot core run. Sampling will begin just above the top of the TTZ at a depth of 65 feet bgs at each of the three potential post-remediation soil boring locations. Once initiated, sampling will continue through the unconsolidated zone to the base of the TTZ at approximately 120 feet bgs or until the top of competent rock is encountered, whichever is shallowest. The samples selected for chemical analysis will be chosen based on the PID field screening readings and/or the presence of visual or olfactory indications of impact. Each soil sample will be collected for chemical analysis using a Terra Core sampler and Method 5035 preservation in accordance with the soil sampling SOPs as described in the QAPP. Soil sample identification will follow a standard convention and is discussed in Section 4.

3.3 Sub-Slab and Indoor Air Sampling

After verification that the RG has been attained for soils and the USEPA has approved ISTR system shutdown, the vapor intrusion mitigation systems (SSDS) for the VIRA inside the ANC building will be

shut down. After approximately 1 to 2 weeks following shut-down, one round of sub-slab vapor and indoor air samples will be collected to determine if the VIRA activities can be discontinued or if vapors are still present above levels that warrant continued operation of the vapor mitigation system and/or further monitoring of sub-slab vapor or indoor air. Indoor air samples will be collected at the following seven locations in accordance with the *Operation, Maintenance, and Monitoring Plan for Vapor Intrusion Response Activities* (Ramboll Environ, 2017).

- Former Molding Area (ISTR-IA01 [formerly CDM-IA-01]);
- EHS Manager's Office (ISTR-IA02 [formerly CDM-IA-04 and EPA-IA-27]);
- S. Central Cafeteria (ISTR-IA03 [formerly CDM-IA-07]);
- EHS Coordinator's Office (ISTR-IA04 [formerly CDM-IA-08]);
- 2nd Floor Sales Office (ISTR-IA05 [formerly EPA-IA-16]);
- MPA between VP-14 and VP-15 (ISTR-IA06 [formerly EPA-IA-18]); and
- 2nd Floor Conference Room (ISTR-IA07 [formerly EPA-IA-23]).

In addition, ten sub-slab vapor samples will be collected from the existing sub-slab vapor monitoring points.

- CDM-SS-01;
- CDM-SS-02;
- CDM-SS-03;
- EPA-SS-22;
- EPA-SS-30;
- EPA-SS-31;
- EPA-SS-32;
- VP-3;
- VP-7; and
- VP-15.

The locations of these indoor areas and sub-slab vapor monitoring points are shown on Figure D-~~4~~5. The samples will be collected and analyzed for VOC using USEPA Method TO-15 in accordance with the QAPP. Indoor air and sub-slab vapor samples will be compared to site specific regulatory criteria as described in the ROD.

Indoor air and sub-slab vapor sample identification will follow a standard convention and is discussed in Section 4.

3.4 Laboratory Analyses

Soil

Soil samples will be shipped to one of the following laboratories (preferred laboratory listed first):

TestAmerica Laboratories, Inc.
777 New Durham Road

Edison, NJ 08817
(732) 549-3900

Integrated Analytical Laboratories (IAL), LLC
273 Franklin Road
Randolph, NJ 07869
(973) 361-4252

Air

Air samples will be shipped to one of the following laboratories (preferred laboratory listed first):

SGS EHS USA (Formerly Accutest Inc)
2235 US Highway 130
Dayton, NJ 08810
(732) 329-0200

TestAmerica Laboratories, Inc.
30 South Community Drive
Burlington, VT 05403
(802) 660-1990

Integrated Analytical Laboratories (IAL), LLC
273 Franklin Road
Randolph, NJ 07869
(973) 361-4252

The laboratory will perform analyses as requested on the chain of custody (Section 6). The laboratory QA plan and relevant SOPs are included in Appendices B through E of the QAPP. Air and soil samples will be analyzed for VOCs using various USEPA Methods (TO-15 for air and 8260C for water and soil).

Samples for waste disposal purposes will require additional analyses. The specific analytical requirements are provided in Table 4A in the QAPP. Additional analytical requirements could be required by the selected disposal facility and will be collected in combination with the analytical requirements in Table 4A of the QAPP and Waste Management Plan (Appendix ~~G~~E of the ~~Final (100%) Remedial Design Report~~RDWP).

4. SAMPLE IDENTIFICATION

The designation or identifier for each sample is used to uniquely identify each type of sample collected at the PVGCS Site. All samples from all sample media will be assigned a unique alpha-numeric sample descriptor identifying the project site (POH). Air samples will include the sample port or location and a six-digit numeric code indicating the date of sample collection (yymmdd). Soil samples collected from soil borings will include the soil boring location and depth interval.

Matrix codes for samples that will be collected include the following:

Project Site Description

- POH – for Pohatcong Valley Groundwater Contamination Superfund Project Site.

Soil Sample Descriptions

- PTSB – for post-treatment soil boring sample locations.

- SB – for soil boring location name.
- WS – for waste soil/sediment samples (characterization for off-site disposal), if collected.

Air Sample Descriptions

- VP-## or [EPA/CDM]-SS-## – for the post-treatment sub-slab vapor sample designation at an existing sub-slab sampling location.

Quality Control Sample Descriptions

- FD – for field duplicate samples
- EB – for field equipment blanks
- TB – for trip blanks (VOCs only)

4.1 Example Soil Sample Designations

The soil sampling program includes the collection and analysis of samples from up to ~~three~~ six locations identified on Figure D-~~3~~4. Soil samples will be collected throughout the TTZ (65 to 120 feet bgs in the Former Molding Room Area and MPA). Soil samples will be designated as:

- POH-PTSB-SB##(XX-XX)

Where ## is the soil boring number (01 through 0~~3~~6), and XX specifies the depth in feet using two digits. For example:

- POH-PTSB-SB01(70-72) will be used for the soil sample collected from soil boring location SB01 from the 70 to 72-foot bgs interval.

4.2 Example Air Sample Designations

The air sampling program includes the collection and analysis of samples from seven indoor air locations and 10 sub-slab vacuum monitoring point (VMP) locations identified on Figure D-~~4~~5 for chlorinated VOCs using USEPA Method TO-15. Air samples are separated into three categories: indoor air, sub-slab vapor, and vapor mitigation system air samples. These categories are described below.

4.2.1 Indoor Air Sample Designations

Indoor air samples will be designated using the following descriptor:

- POH-ISTR-IA##-[yymmdd]

Where ## is the numbered location of the indoor air sample. Each location has been identified and designated a unique name and shown on Figure D-~~4~~5. The [yymmdd] is the year, month, and day the sample is collected. For example:

- POH-ISTR-IA01-181231 would be used for the indoor air sample collected from the former molding area (former indoor air sample location CDM-IA-01) on December 31, 2018.

4.2.2 Sub-Slab Vapor Sample Designations

Sub-slab vapor samples will be designated using the following descriptor:

- POH-SS-[VP-##]/[EPA/CDM-SS-##]-[yymmdd]

Where VP-## or EPA/CDM-SS-## is the sub-slab vapor location and [yymmdd] is the year, month, and day the sample is collected. Each location has been identified and designated a unique name and shown on Figure D-45. A sample identification example is presented below:

- POH-SS-VP-14-190215 would be used for the sub-slab vapor sample collected from the vapor monitoring point VP-14 on February 15, 2019.
- POH-SS-EPA-SS-31-190215 would be used for the sub-slab vapor sample collected from the vapor monitoring point EPA-SS-31 on February 15, 2019.
- POH-SS-CDM-SS-02-190215 would be used for the sub-slab vapor sample collected from the vapor monitoring point CDM-SS-02 on February 15, 2019.

4.3 Example Quality Control Sample Designations

Field duplicate (FD), equipment blank (EB), and trip blank (TB) QC samples will use the appropriate code for the sample matrix and/or type of QC sample. Equipment and trip blank samples will be numbered with the date. Field duplicate samples will have the QC code appended to the end of the sample ID. Example IDs for the types of QC samples are as follows:

- EB-01-190211 – indicates the first or only equipment blank collected on February 11, 2019 (190211).
- TB-02-190301 – indicates the second trip blank associated with soil or groundwater samples that were collected on March 1, 2019 (190301).
- POH-PTSB-SB04(120-121)FD – indicates a field duplicate from the post-remediation performance soil boring SB04 collected from the 120 to 121 feet bgs interval.

4.4 Example Waste Characterization Sample Designations

Waste characterization samples will be collected from soil generated during confirmation soil boring activities. Waste characterization samples will be designated as:

- POH-WS-##-[yymmdd]

Where ## is the sequentially numbered sample (if more than one waste stream is generated) and [yymmdd] is the year, month, and day of sample collection.

5. FIELD PROCEDURES

Field personnel will understand the requirements of this FSP and will be trained in the use of the specified equipment and techniques. The Site Supervisor is responsible for reviewing the day-to-day activities to ensure that the procedures in this FSP are followed. Specific activities that will be implemented by the Site Supervisor include the following:

- A meeting of field personnel will be conducted at the start of a specific sampling event to review the sampling requirements of the FSP; the appropriate equipment and its use; decontamination procedures; and required documentation. This meeting is especially important prior to conducting soil boring work in the thermal treatment zone.
- Review documentation for completeness, errors, problems, and corrective actions taken.
- Convene project team meetings, as needed, to address questions identified during the previous day's work and review the work to be completed that day.

5.1 Field Measurements

The equipment used for in-field measurement will be maintained, calibrated, and used in the field according to the manufacturer's specification. Significant deviations from the FSP, errors, equipment failures, or other problems will be recorded in a bound notebook by the field team and reported to the Project Manager. The field crew using the sampling equipment is required to understand the proper use of the equipment and how to clean and maintain the equipment in proper working order. Field staff will note issues that may affect the quality of the sample collection efforts. Corrective actions, if required, will be coordinated with the project team by the Site Supervisor. Personnel involved in the collection of samples are required to read, understand, and follow the procedures specified in this FSP and in the QAPP.

5.2 Quality Control

QA/QC procedures will be implemented to ensure that data that are used for remediation decisions are of known quality and usable for this purpose. A more complete description of QA/QC procedures, including those implemented by the laboratory are provided in the site-specific QAPP submitted under separate cover. QC procedures include the use of standardized methods (SOPs) for sampling and analysis and documenting the use of those methods so that the data generated are traceable and of known quality. Measures of field and laboratory bias (accuracy) and precision are determined by the collection of QC samples. The results are used in the data review/validation process to provide measures of data quality. QC samples that may be collected during this program are described below.

5.2.1 Field and Laboratory Duplicates

Field and laboratory duplicates are used to evaluate individual sample, sampling, and laboratory variability. Field duplicates will be collected for discrete samples by filling two sample containers (including air or vapor samples). Field duplicate samples will be prepared following compositing by dividing the composited sample into two separate containers. Field duplicate samples will be collected at a frequency of 5% (1 in 20 samples).

5.2.2 Split Samples

As an additional measure of QC, the USEPA may request that split samples be sent to a laboratory of USEPA's choosing. Split samples will be collected in the same manner as field duplicates and will be labeled using the same sample ID as the parent sample with a split sample code (i.e., SP) appended to the end of the sample. Split samples will be given to USEPA's designee and noted in the field book.

5.2.3 Equipment Blanks

Field equipment blanks will be collected and submitted to the analytical laboratory to assess the effectiveness of decontamination procedures. Field equipment blanks will be collected following decontamination of the non-dedicated sampling equipment. Blanks are collected by pouring analyte free water over the decontaminated equipment and into a sample container. Field equipment blanks will not be collected for disposable or dedicated sampling equipment. Field equipment blanks will be collected at a frequency of once per day or once per 20 (individual grab) sample locations, whichever is less frequent. If disposable equipment is used, a single equipment blank will be prepared using that disposable equipment at the beginning of the program. Equipment blanks will not be collected for air or vapor samples.

5.2.4 Trip Blanks

If samples are collected for VOC analysis (or Toxicity Characteristic Leaching Procedure [TCLP]), a trip blank will be included in each cooler containing VOC samples. Trip blanks are used to provide a measure

of the amount of cross contamination, if any, that occurs during cooler storage and transport to the laboratory. A trip blank consists of analyte-free water sealed in a VOC sample container. The trip blank accompanies empty containers to the field and field samples when they are shipped to the laboratory. A trip blank will not accompany air or vapor samples.

5.2.5 Matrix Spike/Matrix Spike Duplicates (MS/MSDs)

MS/MSD samples (duplicate and spike for inorganic analyses) are laboratory QC samples that provide information about the effect of the sample matrix on the analytical results. MS/MSD samples will be analyzed in accordance with the laboratory operating procedures provided in the laboratory QA Plan (Appendix B to the QAPP). For soil and groundwater samples, the MS/MSD samples should be designated on the chain of custody at a frequency of 5% (1 in 20). A MS/MSD will not be collected for air or vapor samples.

5.3 Decontamination Procedures

Decontamination of sampling equipment is performed to reduce the possibility of cross-contamination of samples. Disposable or dedicated equipment does not require decontamination. Equipment used to handle samples will be decontaminated and may include, but will not be limited to, the following:

- down-hole drilling equipment and down-hole drilling equipment tooling;
- soil logging equipment including stainless steel spatulas and table-top; and
- electrical or mechanical mixing equipment for waste characterization composite sample preparation, if necessary.

Decontamination procedures are described in Ramboll SOP S-05 (Appendix A to the QAPP). Field blanks will be collected to measure the effectiveness of decontamination procedures as described in the QAPP and Section 5.2.3 of this FSP.

6. SAMPLE RECORDKEEPING AND HANDLING PROCEDURES

Documentation of sample collection will include photographs, field notes, sample labels, and chain of custody. Hard bound field notebooks will be used by the field team. Daily field activities will be recorded in the field notebooks. Sample collection notebooks will contain sample and collection notes. In some cases, field log sheets may be used to record data in consistent formats. Field notes will be recorded in accordance with Ramboll SOP RK-03 (Appendix A to the QAPP).

The sampler is responsible for sample custody from the time of sample collection to shipment to the laboratory. Chain of custody procedures are discussed in detail in Ramboll SOP RK-02 (Appendix A to the QAPP) and the QAPP. Sample containers, preservation methods, and holding times for samples for chemical analysis are provided in the QAPP. Samples will be packaged and shipped in accordance with Ramboll SOP FLD-03, SOP FLD-04, SOP FLD-05, SOP FLD-07, and SOP FLD-08 (Appendix A to the QAPP). Field book or other (e.g., data sheets or electronic) records will include:

- date;
- field staff present, visitors, and other observations;
- activities conducted;
- sample location information (matrix, sampling coordinates);

- samples collected and methods;
- samples shipped and relevant carrier and air bill information; and
- photographs taken.

Records will be maintained in the permanent project file and will be used in conjunction with laboratory data to report the investigation findings.

Analytical reports will be provided as full Level 4, fully validated data packages. In addition, laboratories will provide electronic data deliverables (EDDs) in Environmental Quality Information System (EQuIS) and Microsoft Excel formats for submission to the USEPA.

7. MANAGEMENT OF WASTE MATERIALS

Soil in excess of the required sample volume will be containerized for off-site disposal. Used PPE and other types of general debris or waste materials produced during the fieldwork will be collected in plastic garbage bags and disposed of as solid waste. A Waste Management Plan is provided as Appendix ~~G~~E of the ~~Final (100%) Remedial Design Report (Ramboll, 2019)~~RAWP.

8. REFERENCES

Consent Decree. 2015. United States of America v. Pechiney Plastics Packaging, Inc. (Civil Action No. 09-cv-05692) and United States of America v. Bristol Myers Squibb Company, et. Al. (Civil Action No. 13-cv-05798), effective March 11.

Ramboll Environ. 2015. Operation, Maintenance, and Monitoring Plan Vapor Intrusion Response Activities Albéa America, Washington Facility 191 Route 31 North Washington, Warren County, New Jersey. October.

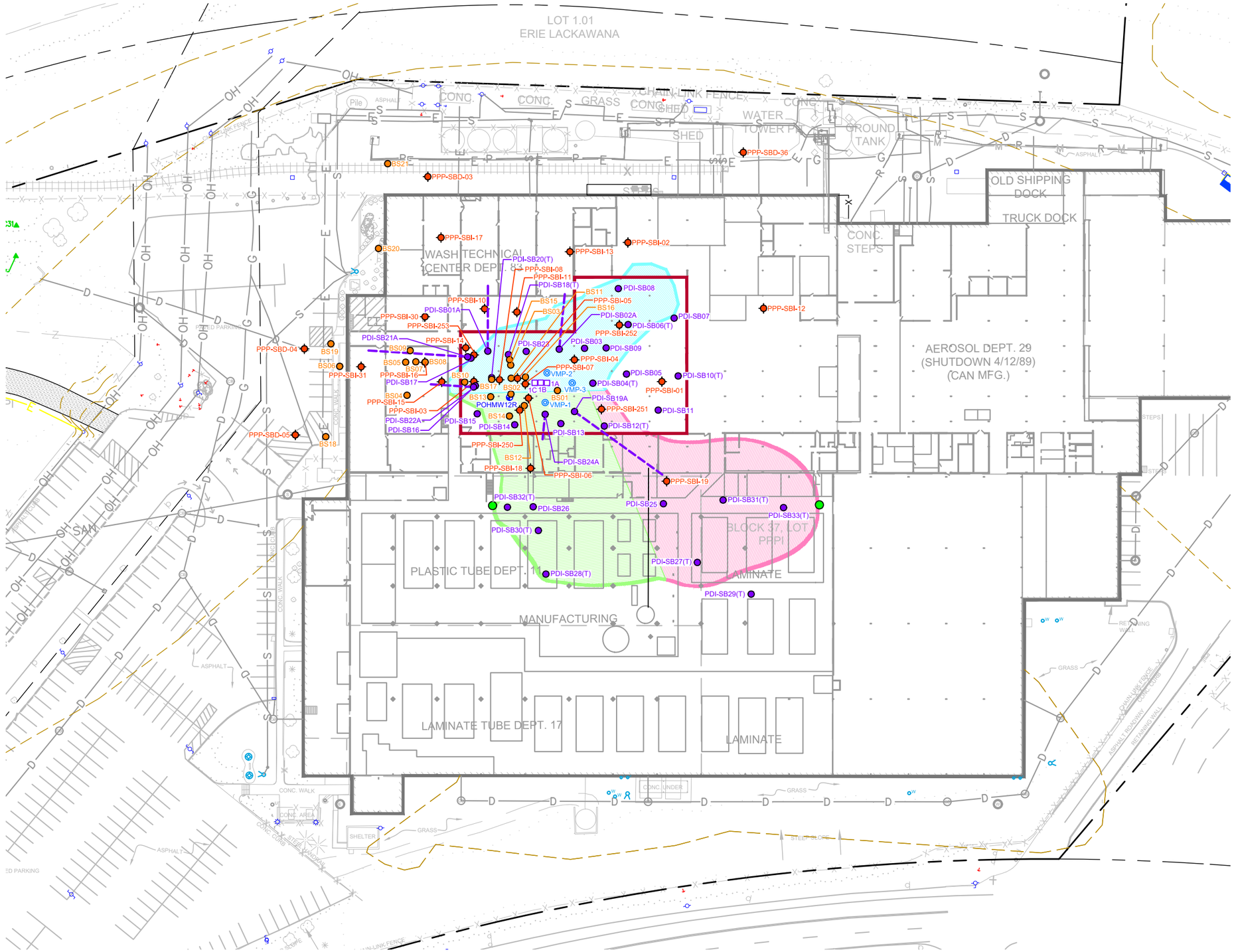
Ramboll US Corporation. 2018a. Quality Assurance Project Plan (Revision 9), OU1 (TCE Groundwater), OU2, OU3, and Vapor Intrusion Removal Action, Pohatcong Valley Groundwater Contamination Superfund Site, Warren County, New Jersey. February.

Ramboll US Corporation. 2018b. Remedial Design Work Plan, Operable Unit 3 (OU3), Pohatcong Valley Groundwater Contamination Site (PVGCS), Warren County, New Jersey. April.

USEPA. 2016a. Record of Decision, Pohatcong Valley Groundwater Contamination Superfund Site Operable Unit 3, Washington Borough and Washington Township, Warren County, New Jersey. September.

USEPA. 2017. Statement of Work for Implementation of the Operable Unit 3 (OU3) Remedial Design and Remedial Action, pursuant to the Consent Decree entered in United States v. Pechiney Plastics Packaging, Inc., (PPPI), 09-cv-5692 and United States v. Bristol Myers Squibb Co., et al., 13-cv-5798. June.

FIGURES



LEGEND:

- POTENTIAL SOIL BORING LOCATION DURING ISTR SYSTEM INSTALLATION
- MONITORING WELL
- ANGLED SOIL BORING
- SOIL BORING
- SOIL BORING (REMEDIAL INVESTIGATION)
- SOIL BORING (EPA)
- VAPOR MONITORING PROBE
- SVE PILOT TEST WELL
- (T) ISTR THERMOCOUPLE LOCATION
- BUILDING COLUMN
- FORMER MOLDING ROOM
- EXTENT OF TCE SOIL IMPACT (GROUP A)
- EXTENT OF TCE SOIL IMPACT (GROUP B)
- EXTENT OF TCE SOIL IMPACT (GROUP C)
- E ELECTRIC LINE
- G GAS LINE
- S WATER LINE
- D STORM LINE

0 80
SCALE IN FEET

POTENTIAL SOIL SAMPLING LOCATIONS

POHATCONG VALLEY GROUNDWATER CONTAMINATION SUPERFUND SITE
OPERABLE UNIT (OU) 3
WARREN COUNTY, NEW JERSEY

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FIGURE **D-3**

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LEGEND:

- MONITORING WELL
- ISTR HEATER (VERTICAL)
- ISTR HEATER (ANGLED)
- ISTR HEATER CLUSTER (ANGLED)
- TEMPERATURE MONITORING POINT
- POTENTIAL POST-REMEDIATION SOIL BORING (DRAFT LOCATION- TO BE CONFIRMED IN THE FIELD)
- SVE/SSDS EXTRACTION POINT
- WEST WALL SUB SLAB DEPRESSURIZATION EXTRACTION POINT (STANDBY SSDS POINT)
- EAST WALL SUB SLAB DEPRESSURIZATION EXTRACTION POINT
- VAPOR MONITORING PROBE
- BUILDING COLUMN
- FORMER MOLDING ROOM
- EXTENT OF TCE SOIL IMPACT (GROUP A)
- EXTENT OF TCE SOIL IMPACT (GROUP B)
- EXTENT OF TCE SOIL IMPACT (GROUP C)

NOTE:
POTENTIAL POST-REMEDIATION PERFORMANCE SOIL BORING LOCATIONS MAY VARY DEPENDING ON FINAL CONFIGURATION OF ISTR HEATER WELL LOCATIONS.

0 60
SCALE IN FEET

POTENTIAL POST-REMEDIATION PERFORMANCE SOIL BORING LOCATIONS

POHATCONG VALLEY GROUNDWATER CONTAMINATION
SUPERFUND SITE
OPERABLE UNIT (OU) 3
WARREN COUNTY, NEW JERSEY

RAMBOLL

FIGURE **D-4**

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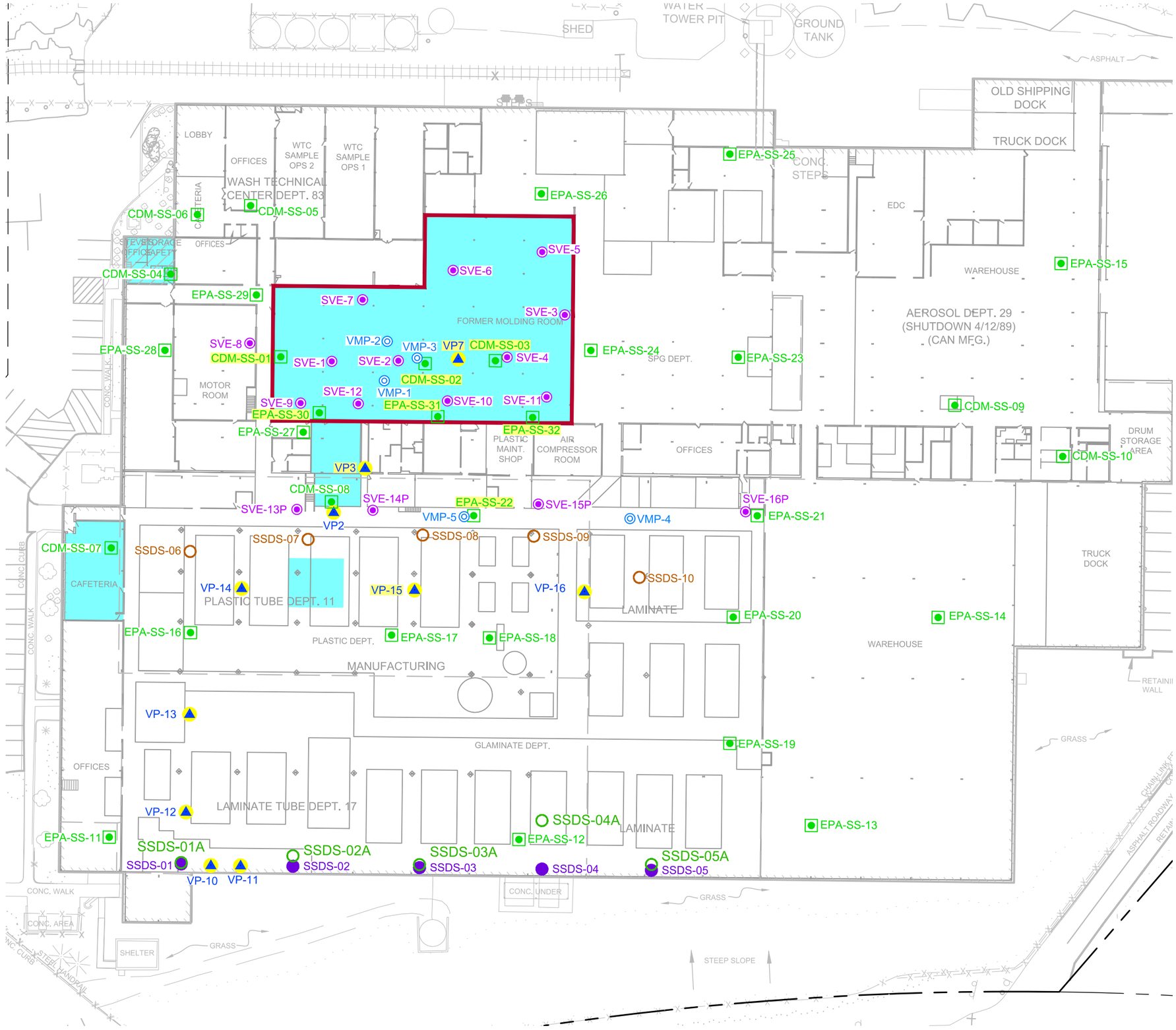

LEGEND

- SOURCE AREA
- EPA-SS — SUB SLAB VAPOR MONITORING POINT (INSTALLED BY OTHERS)
- VP — SUB SLAB VAPOR MONITORING POINT (INSTALLED BY ENVIRON)
- SVE — SVE/SSDS EXTRACTION POINT
- SSDS — WEST WALL SUB SLAB DEPRESSURIZATION EXTRACTION POINT (STANDBY SSDS POINT)
- SSDS — EAST WALL SUB SLAB DEPRESSURIZATION EXTRACTION POINT
- VAPOR MONITORING PROBE
- POST-ISTR OPERATION INDOOR AIR SAMPLE LOCATION
- VP7 — POST-ISTR OPERATION SUB-SLAB VAPOR SAMPLE LOCATION

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SCALE IN FEET

POST-ISTR OPERATION INDOOR AIR AND SUB SLAB VAPOR SAMPLING LOCATIONS

POHATCONG VALLEY GROUNDWATER CONTAMINATION SITE
OPERABLE UNIT (OU) 3
WARREN COUNTY, NEW JERSEY

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FIGURE **D-5**

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ATTACHMENT 1

ISTR SPECIFIC STANDARD OPERATING GUIDELINES AND PROCEDURES

APPENDIX E
Waste Management Plan

APPENDIX F

Operation, Maintenance, and Monitoring Plan

APPENDIX G
Health and Safety Plans

APPENDIX H
Contingency Plan